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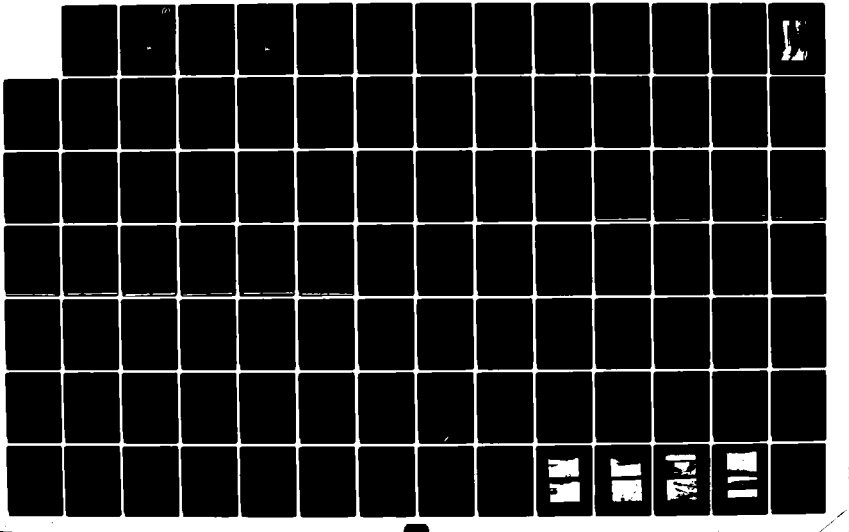

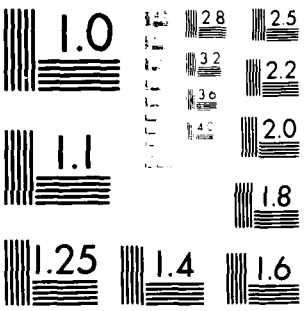

THAMES RIVER BASIN
ASHFORD, CONNECTICUT

GOSS BROOK DAM
CT 00465

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

SEPTEMBER, 1980

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Thames River Basin
Ashfor, Connecticut

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The project, is an earth embankment approximately 650 feet in length with an emergency spillway at tis left end. It is approximately 40.5 feet in height and is capable of impounding 600 acre-feet of water. Based upon the visual inspection and past performance, the project is judged to be in fair condition. In accordance with the U.S. Army Corps of Engineers guidelines, Goss Brook Dam is classified as a high hazard, intermediate size dam. The test flood for the Goss Brook Dam is equivalent to the PMF.

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THAMES RIVER BASIN
ASHFORD, CONNECTICUT

GOSS BROOK DAM
CT 00465

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

SEPTEMBER, 1980

BRIEF ASSESSMENT

PHASE I INSPECTION REPORT

NATIONAL PROGRAM OF INSPECTION OF DAMS

Name of Dam:	GOSS BROOK DAM
Inventory Number:	CT 00465
State.	CONNECTICUT
County:	WINDHAM
Town:	ASHFORD
Stream:	GOSS BROOK
Owner:	INDIAN TRAILS COUNCIL, B.S.A.
Date of Inspection:	AUGUST 21, 1980
Inspection Team:	PETER HEYNEN, P.E.
	HECTOR MORENO, P.E.
	ERIC TEALE, P.E.
	THEODORE STEVENS
	ANTHONY BELLA

The project, completed in 1963 to impound a recreation pond, is an earth embankment approximately 650 feet in length with an emergency spillway at its left end. It is approximately 40.5 feet in height and is capable of impounding 600 acre-feet of water. The principal spillway is a drop inlet type structure consisting of a reinforced concrete riser with a 42 inch diameter reinforced concrete outlet pipe which discharges to the natural streambed of Goss Brook at the downstream toe of the embankment. A 30 inch diameter low-level intake and sluice gate are also included in the principal spillway structure. The grass-bottomed emergency spillway channel is cut into natural ground at the left end of the dam and has a crest length of 120 feet. The upstream slope of the embankment includes an 8 foot wide berm at the normal pool elevation and is protected by riprap to 2 feet above the berm. The top and slopes of the dam are grass covered, with a filter blanket at the toe of the downstream slope.

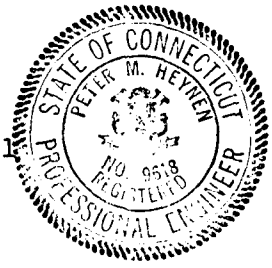
Based upon the visual inspection and past performance, the project is judged to be in fair condition. There are items which require maintenance or evaluation, such as possible slight tilting of the concrete principal spillway structure and potential for erosion of the emergency spillway embankment.

In accordance with the U.S. Army Corps of Engineers guidelines, Goss Brook Dam is classified as a high hazard, intermediate size dam. The test flood for the Goss Brook Dam is equivalent to the PMF. Peak inflow to the pond at test flood is 3,600 cubic feet per second (cfs); peak outflow is 3,200 cfs with the dam maintaining a freeboard of 1.0 foot. The combined spillway capacity with the pond level to the top of the dam is 4,700 cfs, which is equivalent to 150% of the routed test flood outflow.

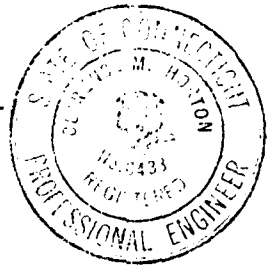
It is recommended that the owner retain the services of a registered professional engineer and licensed surveyor to monitor any possible movement of the principal spillway structure and to design riprap to prevent erosion of the emergency spillway embankment.

The above recommendations and further remedial measures presented in Section 7 should be instituted within one year of the owner's receipt of this report.

Peter M. Heynen, P.E.
Project Manager - Geotechnical
Cahn Engineers, Inc.



C. Michael Horton, P.E.
Chief Engineer
Cahn Engineers, Inc.



This Phase I Inspection Report on Goss Brook Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and are hereby submitted for approval.

ARAMAST MAHTESIAN, Member
Geotechnical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, Member
Design Branch
Engineering Division

RICHARD DIBUONO, Chairman
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYER
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspection. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam would necessarily represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions will be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions there of. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as neccessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

The information contained in this report is based on the limited investigation described above and is not warranted to indicate the actual condition of the dam. The integrity of the dam can only be determined by a means of a monitoring program and/or a detailed physical investigation. The accuracy of available data is assumed where not in obvious conflict with facts observable during the visual inspection.

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SECTION 7: ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

APPENDICES

OVERVIEW PHOTO
(August, 1980)

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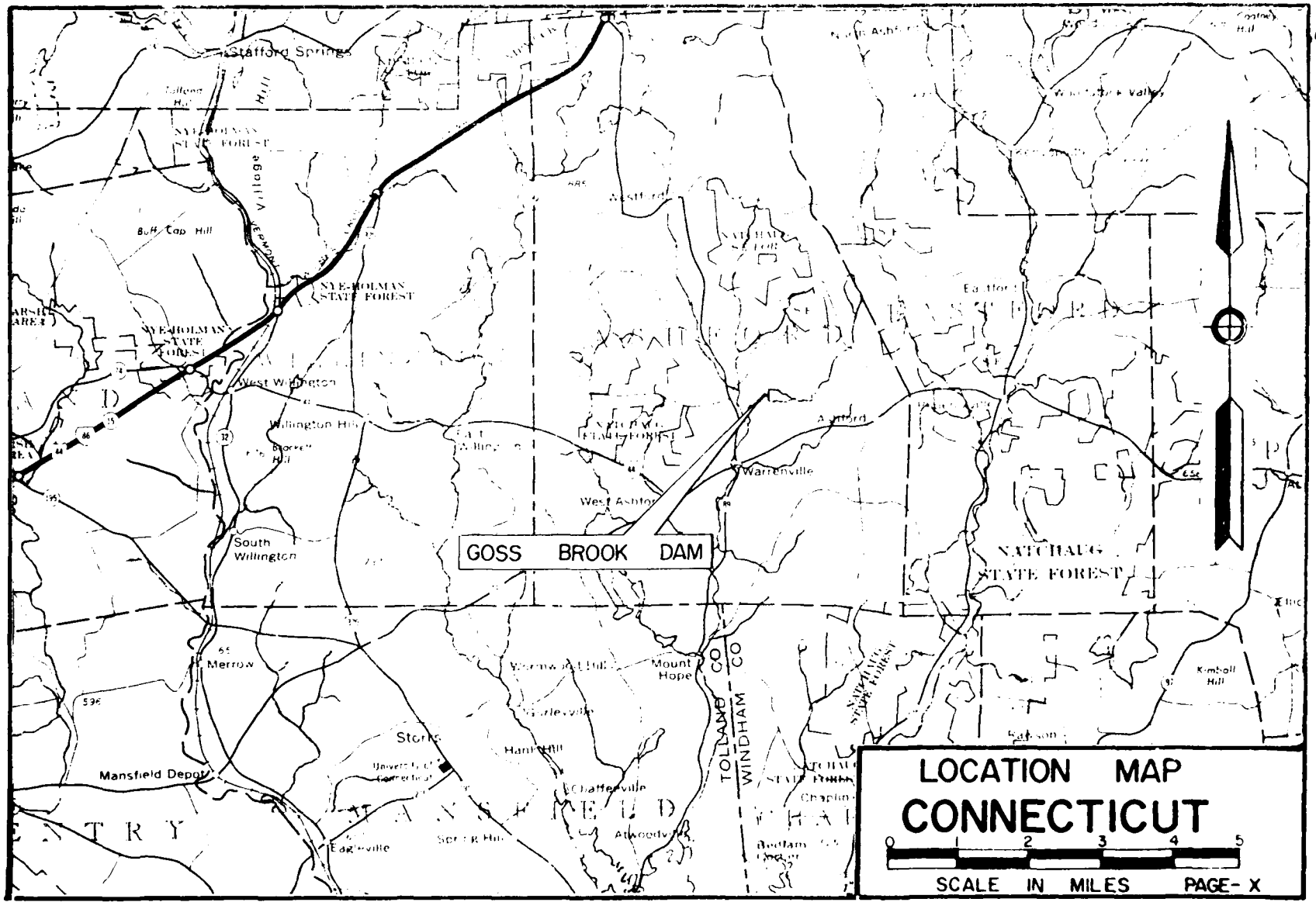

GOSS BROOK DAM
Stafford Springs
Bull Cap Hill
SYE-HOLMAN STATE FOREST
West Willington
Willington Hill
South Willington
Merrow
Mansfield Depot
Storrs
Eagleville
Warrenville
West Ashford
Mount Hope
TOLLAND CO
WINDHAM CO
NATCHAUG STATE FOREST
Kimball Hill
LOCATION MAP
CONNECTICUT
0 1 2 3 4 5
SCALE IN MILES
PAGE- X

PHASE I INSPECTION REPORT

GOSS BROOK DAM

SECTION I - PROJECT INFORMATION

1.1 GENERAL

a. Authority - Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Cahn Engineers, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Cahn Engineers, Inc. under a letter of April 14, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW 33-80-C-0052 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection Program - The purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring correction in a timely manner by non-federal interests.

2. Encourage and prepare the States to quickly initiate effective dam inspection programs for non-federal dam.

3. To update, verify and complete the National Inventory of Dams.

c. Scope of Inspection Program - The scope of this Phase I inspection report includes:

1. Gathering, reviewing and presenting all available data as can be obtained from the owners, previous owners, the state and other associated parties.

2. A field inspection of the facility detailing the visual condition of the dam, embankments and appurtenant structures.

3. Computations concerning the hydraulics and hydrology of the facility and its relationship to the calculated flood through the existing spillway.

4. An assessment of the condition of the facility and corrective measures required.

It should be noted that this report passes judgment only on those factors of safety and stability which can be determined by a visual surface examination. The inspection is to identify those visually apparent features of the dam which evidence the need for corrective action and/or further study and investigation.

1.1 DESCRIPTION OF PROJECT

a. Location - The dam is located on Goss Brook in the Thames River Basin in a rural area of the Town of Ashford, County of Windham, State of Connecticut. The project is shown on the Westford USGS Quadrangle Map, having coordinates latitude N41°52.8' and longitude W72°09.1'.

b. Description of Dam and Appurtenances - As shown on Sheets B-1 to B-5, the dam is an earth embankment approximately 650 feet long and 40.5 feet high. The dam has a top elevation of 498.0 and a top width of 15 feet. The upstream slope is inclined at 3 horizontal to 1 vertical with an 8 foot wide berm at normal pool elevation 490.0 and riprap to elevation 492.0. The downstream slope is inclined at 2½ horizontal to 1 vertical and contains a filter drain along its toe.

The principal spillway is a concrete drop inlet type structure located on the upstream slope approximately 200 feet from the right end of the dam. The spillway crest, at elevation 490.0, has a length of 21 feet and is protected by a galvanized steel pipe trash rack. The upstream end of a 42 inch reinforced concrete pipe, at invert elevation 470.0, joins the bottom of the concrete spillway riser. The pipe outlets at the toe of the dam, 160 feet downstream of the riser, at invert elevation 459.0. The low-level inlet to the spillway riser is a 30 inch bituminous coated corrugated metal pipe at invert elevation 470.5. The pipe extends approximately 30 feet upstream from the spillway riser, to the toe of the upstream slope, and is controlled by a manually operated sluice gate on the upstream wall of the riser.

The emergency spillway is cut into natural ground at the left end of the dam. The approach channel, control section and discharge channel are grass covered, with a high natural embankment to the left and a low earthfill embankment to the right. The control section, or crest, at elevation 493.3, is 120 feet long and 30 feet wide with approach and discharge channel slopes varying from 1.0% to 2.0%.

c. Size Classification - (INTERMEDIATE) - The dam is 40.5 feet in height and, with the reservoir level to the top of the dam, impounds approximately 600 acre-feet of water. According to recommended guidelines, a dam of this height is classified as intermediate in size.

d. Hazard Classification - (HIGH) - If the dam were breached, there is potential for loss of more than a few lives at recreational and camping facilities in an approximately 1500 foot reach immediately downstream of the dam in the June Norcross Webster Scout Reservation. These facilities, which include a rifle range, an archery range and camp sites are at elevations as low as approximately 7 feet above the streambed and upon failure of the dam would be innundated by up to 11.4 feet of water.

e. Ownership - Boy Scouts of America
Indian Trails Council
5 Connecticut Avenue
Norwich, Connecticut, 06360

Mr. Anthony Booth
Mr. Robert Udell
Scout Executives
(203) 887-9291

The dam has been under the same ownership since its construction in 1963.

f. Operator - Mr. Darrell Santor
Camp Ranger
Webster Scout Reservation
(203) 429-9918
Home - (203) 429-1086

g. Purpose of Dam - The dam impounds a recreation pond used for boating and swimming by the Boy Scouts.

h. Design and Construction History - The dam was designed in 1961 and 1962 by the U.S. Department of Agriculture, Soil Conservation Service. The design was reviewed and approved by the State of Connecticut Water Resources Commission. Construction of the project, which was inspected and approved by the Water Resources Commission, took place in 1962 and 1963.

i. Normal Operational Procedures - During the summer months, when the pond is used for recreation, the low-level outlet is kept in a closed position and the pond level is maintained at about the elevation of the spillway crest. During the fall or winter the pond is lowered 8 to 10 feet and raised again in the spring.

1.3 PERTINENT DATA

a. Drainage Area - The drainage area is 1.8 square miles of mostly undeveloped, wooded, rolling terrain. Sabo Pond and Ashford Lake are located on Goss Brook approximately 8,000 and 10,000 feet, respectively, upstream of Goss Brook Dam.

b. Discharge at Damsite - Discharge is over the principal spillway, through the 30 inch low-level inlet to the spillway riser and over the emergency spillway.

1. Low-level outlet works (conduits) 30 inch low-level inlet to spillway riser @ invert el. 470.5:	20± cfs (pond level to test flood el. 497.0)
2. Maximum flood at damsite:	Not known

3. Principal spillway capacity @ top of dam el. 498.0:	280 cfs
4. Emergency spillway capacity @ top of dam el. 498.0:	4,420 cfs
5. Principal spillway capacity @ test flood el. 497.0:	270 cfs
6. Emergency spillway capacity @ test flood el. 497.0:	2,930 cfs
7. Gated spillway capacity @ normal pool:	N/A
8. Gated spillway capacity @ test flood:	N/A
9. Total spillway capacity @ test flood el. 497.0:	3,200 cfs
10. Total project discharge @ top of dam el. 498.0:	4,700 cfs
11. Total project discharge @ test flood el. 497.0:	3,200 cfs

c. Elevations - Elevations are on National Geodetic Vertical Datum (NGVD), as shown on existing drawings.

1. Streambed at toe of dam:	457.5±
2. Bottom of cutoff:	451.5±
3. Maximum tailwater:	Not known
4. Normal pool:	490.0
5. Full flood control pool:	N/A
6. Spillway crest (ungated)	
Principal spillway:	490.0
Emergency spillway:	493.3
7. Design surcharge (original design):	496.0
8. Top of dam:	498.0
9. Test flood surcharge:	497.0

d. Reservoir Length

1. Normal pool:	2,000± ft.
2. Flood control pool:	N/A

3. Spillway crest pool	
Principal Spillway:	2,000± ft.
Emergency spillway:	2,165± ft.
4. Top of dam pool:	2,400± ft.
5. Test flood pool:	2,350± ft.
e. Reservoir Storage	
1. Normal pool:	340± acre-ft.
2. Flood control pool:	N/A
3. Spillway crest pool	
Principal spillway:	340± acre-ft.
Emergency spillway:	450± acre-ft.
4. Top of dam pool:	600± acre-ft.
5. Test flood pool:	565± acre-ft.
f. Reservoir Surface	
1. Normal pool:	23.9± acres
2. Flood control pool:	N/A
3. Spillway crest pool	
Principal spillway:	23.9± acres
Emergency spillway:	29.3± acres
4. Top of dam pool:	36.5± acres
5. Test flood pool:	35.3± acres
g. Dam	
1. Type:	Earth embankment
2. Length:	650± ft.
3. Height:	40.5± ft.
4. Top width:	15 ft.
5. Side slopes:	3H to 1V upstream 2.5H to 1V downstream
6. Zoning:	Filter drain material on downstream slope.
7. Impervious core:	N/A

8. Cutoff:	Trench - 12 ft. wide bottom with 1:1 slopes.
9. Grout curtain:	N/A
10. Other:	8 ft. wide berm on upstream slope
h. Diversion and Regulating Tunnel	N/A
i. Spillways	
Principal Spillway	
1. Type:	Concrete drop inlet to 42" outlet pipe
2. Length of weir:	21.0 ft.
3. Crest elevation:	490.0
4. Gates:	N/A
5. Upstream channel:	N/A
6. Downstream channel:	Natural streambed
7. General:	Galvanized steel pipe trash rack
Emergency Spillway	
1. Type:	Grassed channel cut into natural ground
2. Length of weir (control section):	120 ft.
3. Crest elevation:	493.3
4. Gates	N/A
5. Upstream channel:	Grassed, 1.0%-2.0% slope
6. Downstream channel:	Grassed, 1.0%-1.9% slope
7. General:	30 ft. wide trapezoidal control section
j. Regulating Outlets	
Low-level inlet to spillway riser	
1. Invert:	470.5

2. Size:	30 in. dia.
3. Description:	Bituminous coated corrugated metal pipe
4. Control mechanism:	Manually operated sluice gate
5. Other:	N/A

SECTION 2: ENGINEERING DATA

2.1 DESIGN DATA

The available design data consists of design drawings and "Information storage and Retrieval - Dams Planned and Constructed by SCS" from the Soil Conservation Service, and correspondence concerning design of the project. (See Appendix B).

2.2 CONSTRUCTION DATA

The available construction data consists of construction specifications and construction inspection reports.

2.3 OPERATIONS

Pond level readings are not taken and no formal operations records are known to exist.

2.4 EVALUATION OF DATA

a. Availability - Available data was provided by the State of Connecticut and the Soil Conservation Service. The owner made the project available for visual inspection.

b. Adequacy - Since detailed design and construction data is available, the assessment of the project may be based on a review of this data, visual inspection, performance history, hydraulic computations of spillway capacity, and hydrologic estimates.

c. Validity - A comparison of record data and visual observations indicates that the as-built condition of the emergency spillway is not as depicted on the design drawings of the project (See Sheet B-1). The drawings show the emergency spillway to be entirely cut into natural ground and do not indicate the existence of the earthfill embankment along the right side of the emergency spillway. No other significant discrepancies in the record data were detected.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General - The project is in fair condition. The inspection indicated that some monitoring of the project is required. At the time of inspection, the pond level was at elevation 490.1±; i.e. 0.1 foot above the principal spillway crest.

b. Dam

Top of Dam - The top of the dam is in good condition. In general, grass cover is good, but vehicle tracks and a few sparse areas are evident (Photo 1). One muddy area, with ruts of up to 8 inches in depth, was observed approximately 100 feet from the left end of the dam.

Upstream Slope - The upstream slope is in good condition. Grass cover is good on the upper portion of the slope, but some small brush is growing near the water's edge (Photo 2). Riprap, which extends to approximately 2 feet above the normal pool elevation, appears adequate, though some minor displacement of rocks has occurred.

Downstream Slope - The downstream slope is in good condition, with good grass cover. Scattered small brush (less than 1 year old) is present on the slope (Photo 3). Controlled seepage estimated at 10 to 20 gallons per minute (gpm), was observed to be emanating from the filter blanket at the toe of the slope below elevation 470±, approximately 20 feet below the upstream water level. All seepage appears clear and all indications are that the filter blanket is functioning properly, except that the area at the toe to the left of the principal spillway is relatively flat and is not well drained. This causes a generally wet condition along the toe (Photo 4), and thick brush, which obscures observation of the toe, is growing in the wet area (Photo 3). No seepage other than that emanating from the area of the filter blanket was observed.

Spillways - There is no access bridge from the dam to the principal spillway structure, but viewed from the dam the concrete appears in very good condition with only very minor spalling noted below the normal pool elevation (Photo 5). It was observed that the uppermost pipe of the left side trash rack was mostly above the water surface, while that on the right side was mostly submerged. Subsequent lock level measurements also suggest that the top of the structure on the left side is about 3/4± inch above the top on the right side, indicating possible tilting of the structure. The spillway crest and upstream face of the concrete riser could not be inspected. Observed from its downstream end, the 42 inch spillway discharge conduit appears to be in good condition (Photo 6).

The emergency spillway is in good condition with good grass cover on the channel bottom. Many saplings are growing on both the natural embankment to the left, and the low earthfill embankment to the right of the spillway channel (Photo 7). Footpaths are present across the channel, on the natural embankment and on the earthfill embankment. Adjacent to the control section, or crest, of the emergency spillway, the top of the earthfill embankment is at an elevation approximately ½ foot below the top of the dam.

c. Appurtenant Structures - Due to lack of access from the dam, the low-level outlet gate mechanism could not be inspected. Viewed from the dam, there were not any noticeable defects or deficiencies in the gate valve stem and the operator reports that the gate is operable.

d. Reservoir Area - The area along the right shoreline is wooded and the area along the left shoreline, developed for recreation, includes a beach, docks and an amphitheater.

e. Downstream Channel - The downstream channel is the natural streambed of Goss Brook and passes through a wooded area in a narrow V-shaped valley approximately 3,500 feet to its confluence with the Mount Hope River.

3.2 EVALUATION

Based upon the visual inspection, the project is assessed as being in fair condition. The manner in which the features identified in Section 3.1 could affect the future condition and/or stability of the project is as follows:

1. Possible tilting of the principal spillway intake structure could continue, possibly threatening its stability.

2. Vehicle tracks and areas of sparse grass cover on the top of the dam are susceptible to erosion.

3. If allowed to grow unchecked, brush on the dam could be uprooted, causing damage to the embankment.

4. The areas where footpaths cross the emergency spillway channel and the earthfill embankment to its right are susceptible to erosion during operation of the emergency spillway.

5. Brush growing from the wet area at the toe of the dam obscures observation of discharges from the filter blanket.

SECTION 4: OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 OPERATIONAL PROCEDURES

a. General - During the summer months, the pond level is maintained at about the elevation of the spillway crest. During the off-season, the pond level is lowered 8 to 10 feet, in order to kill some of the vegetation around the shoreline. The pond level is then raised again in the spring. The handle for the gate valve stem is kept at the operator's house.

b. Description of Any Warning System in Effect - No warning system is in effect.

4.2 MAINTENANCE PROCEDURES

a. General - Brush and saplings on the dam are removed yearly. The spillway intake structure and discharge channel is kept clear of debris. The operator makes frequent non-technical inspections of the project.

b. Operating Facilities - The operating facilities are exercised and lubricated on a regular basis.

4.3 EVALUATION

The operational and maintenance procedures are fair. A formal program of operational and maintenance procedures should be implemented, including documentation to provide records for future reference. Remedial operational and maintenance procedures are presented in Section 7.3.

SECTION 5: EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 GENERAL

The Goss Brook Dam watershed is 1.8 square miles of rolling, wooded terrain. Ashford Lake, an upstream impoundment, creates a small reduction in the peak inflow to Goss Brook Dam.

The dam is an earth embankment with a principal conduit spillway and an adjacent depressed earth section which serves as an emergency spillway. It is basically a low surcharge storage - high spillage type project. The available storage reduces the outflow from a Probable Maximum Flood (PMF) of 3,600 cubic feet per second (cfs) to 3,200 cfs and the ½ PMF outflow from 1,800 cfs to 1,500 cfs.

5.2 DESIGN DATA

The original construction drawings, prepared in 1962 by the U.S. Department of Agriculture, Soil Conservation Service are available for this project. It appears that the dam was designed to maintain 2 feet of freeboard at a design flood flow of 3935 cfs (Appendix B-6, B-8).

5.3 EXPERIENCE DATA

No information is available.

5.4 VISUAL OBSERVATIONS

It was observed that while the height of the dam is listed as 38 feet on the construction drawings, the actual height to the streambed downstream from the dam is approximately 40.5 feet. It was noted that the control section of the emergency spillway is downstream of the axis of the dam and that the earthfill embankment to the right of the emergency spillway is at an elevation approximately ½ foot lower than the top of the dam.

5.5 TEST FLOOD ANALYSIS

Based upon the U.S. Army Corps of Engineers "Preliminary Guidance for Estimating Maximum Probable Discharges" dated March, 1978; the watershed classification (Rolling), the watershed area of 1.8 square miles and the reduction in flow created by Ashford Lake, a PMF of 3,600 cfs or 2,000 cfs per square mile is estimated at the damsite. In accordance with the size (intermediate) and hazard (high) classification of Goss Brook Dam, the test flood is equivalent to the PMF. The pond level at the start of the test flood is considered to be at the principal spillway crest elevation 490. The peak outflow for the test flood is estimated at 3,200 cfs and this flow will be accomodated by the principal and emergency spillways with 1 foot of freeboard to the top of the dam and 0.5 foot of freeboard to the top of the embankment adjacent to the control section of the emergency spillway. Based on hydraulic computations, the total spillway capacity to the top of the dam is 4,700 cfs which is equivalent to 150% of the routed test flood outflow (Appendix D-6).

5.6 DAM FAILURE ANALYSIS

The dam failure analysis is based on the April, 1978 Army Corps of Engineers "Rule of Thumb Guidance for Estimating Downstream Dam Failure Hydrographs". With the pond level at the test flood surcharge elevation, peak outflow before failure of the dam would be about 3,200 cfs and the peak failure outflow from the dam breaching would total about 61,000 cfs. A breach of the dam would result in an 11.8 foot rise in the water level of the stream at the initial impact area, from a depth of 6.6 feet just before the breach to a depth of about 18.4 feet shortly after the breach. At the impact area, the 6.6 foot deep pre-failure flow will be contained in the stream channel and there will be no pre-failure flooding of the recreational and camping facilities which comprise the initial impact area and are as low as 7 feet above the streambed. Therefore, the 11.8 foot increase in the water level due to a breach of the dam would innundate the impact area by up to 11.4 feet, potentially causing the loss of more than a few lives. Based on the dam failure analysis, Goss Brook Dam is classified as a high hazard dam (Appendix D-12).

SECTION 6: EVALUATION OF STRUCTURAL STABILITY

6.1 VISUAL OBSERVATIONS

The visual inspection did not reveal any indications of immediate stability problems, although tilting of the concrete principal spillway intake structure would be a cause for concern.

6.2 DESIGN AND CONSTRUCTION DATA

The design drawings of the project depict the embankment as having a top width of 15 feet, a maximum base width of 215 feet, a 2.5 horizontal to 1 vertical downstream slope, and a 3 horizontal to 1 vertical upstream slope with an 8 foot wide berm at the normal pool elevation. At the deepest part of the stream valley now occupied by the dam, the cutoff trench is shown to be dug to elevation 451.5, or approximately 10.5 feet into natural ground. This gives the dam a structural height of 46.5 feet, in comparison to its hydraulic height of 40.5 feet (Sheets B-1 to B-4).

The principal spillway intake structure is shown to be constructed of reinforced concrete. It is 25 feet in height and founded on a 15'-4" x 7'-10", 14" thick slab. At the top, the structure widens and is capped with a 21'-6" x 12'-10", 8" thick slab. The riser has outside dimensions of 5'-10" x 12'-10" and has 14" thick walls (Sheet B-5).

During the design of the project, an engineering consultant to the Water Resources Commission reviewed the design drawings and recommended that the size of the base of the spillway structure be increased to provide greater stability, (Appendix B-13). This recommendation was refuted by the Soil Conservation Service (B-15 & 16), and the structure was constructed as described above, without spread footings.

After construction of the dam, when the pond was being filled, a "crack" in the dam in the vicinity of the spillway intake structure was noted (B-34). Although the extent of the cracking was not described, it was generally attributed to inadequate soil compaction and subsequent saturation, causing "some" subsidence. At that time, level and plumb on the structure were checked and no indication of movement was detected. It was recommended that the structure be monitored for movement, but this recommendation was never implemented.

The foregoing is not a cause for serious concern. However, considering the possible minor tilting of the structure observed during the field inspection, a need for more information is indicated.

6.3 POST-CONSTRUCTION CHANGES

There are no known post-construction changes to the project.

6.4 SEISMIC STABILITY

The dam is in Seismic Zone 1, and according to U.S. Army Corps of Engineers' Recommended Guidelines, need not be evaluated for seismic stability.

SECTION 7: ASSESSMENT, RECOMMENDATIONS, REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Condition - Based upon the visual inspection and past performance, the project is in fair condition. No evidence of instability was observed in the embankment; however, a possible problem with the stability of the concrete spillway intake structure and a potential for erosion of the emergency spillway embankment have been identified.

Based upon the U.S. Army Corps of Engineers' "Preliminary Guidance for Estimating Maximum Probable Discharges" dated March, 1978, the watershed area and classification, and nydraulic/hydrologic computations, peak inflow to the reservoir at test flood is 3,600 cfs; peak outflow is 3,200 cfs, with the dam maintaining a freeboard of 1.0 foot. Based upon hydraulics computations, the total spillway capacity to the top of the dam is 4,700 cfs, which is equivalent to 150% of the routed test flood outflow and adequate to pass expected peak flows without overtopping of the dam.

b. Adequacy of Information - The information available is such that an assessment of the condition and stability of the project must be based on a review of existing engineering data, visual inspection, past performance and sound engineering judgement.

c. Urgency - It is recommended that the measures presented in Section 7.2 and 7.3 be implemented within one year of the owner's receipt of this report.

7.2 RECOMMENDATIONS

It is recommended that further studies be made by a registered professional engineer qualified in dam design and inspection pertaining to the following items. Recommendations made by the engineer should be implemented by the owner.

1. Monitoring of the spillway intake structure to check for possible tilting.

2. Removal of brush and saplings from the earthfill embankment along the right side of the emergency spillway, raising of the embankment to the elevation of the top of the dam and placement of riprap to prevent erosion of the embankment during operation of the emergency spillway.

3. Establishment of a program to monitor seepage emanating from the filter blanket at the toe of the dam.

7.3 REMEDIAL MEASURES

a. Operation and Maintenance Procedures - The following measures should be undertaken by the owner within the length of time indicated in Section 7.1.c, and continued on a regular basis:

1. Round-the-clock surveillance should be provided during periods of heavy precipitation or high project discharge. A formal downstream warning system should be developed, to be used in case of emergencies at the dam.

2. A formal program of operation and maintenance procedures should be instituted and fully documented to provide accurate records for future reference.

3. A comprehensive program of inspection by a registered professional engineer qualified in dam inspection should be instituted on an annual basis.

4. The removal of brush and saplings should be continued as part of the routine maintenance procedures at the dam and expanded to include removal of brush from the wet area at the toe of the dam.

5. The rutted areas and areas of sparse grass cover on the dam and emergency spillway should be regraded and seeded.

7.4 ALTERNATIVES

This study has identified no practical alternatives to the above recommendations.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Goss Brook Dam DATE: August 21, 1980

TIME: 1:00 pm

WEATHER: Windy, 60°

W.S. ELEV. 490.1± U.S. 457.0± DN.S

PARTY:	INITIALS:	DISCIPLINE:
1. Peter Heynen	PH	Geotechnical
2. Theodore Stevens	TS	Geotechnical
3. Eric Teale	ET	Geotechnical
4. Hector Moreno	HM	Hydraulics
5. Anthony Bella	AB	Hydraulics
6.		

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam Embankment	All	Good Condition
2.	Principal Spillway	All	Good Condition
3.	Emergency Spillway	All	Good Condition
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

PERIODIC INSPECTION CHECK LIST

PROJECT Goss Brook Dam DATE 8/21/80

PROJECT FEATURE Dam Embankment BY PH,IS,ET,HM,AB

AREA EVALUATED		CONDITION
DAM EMBANKMENT		
Crest Elevation		498.0±
Current Pool Elevation		490.1±
Maximum Impoundment to Date		Not known
Surface Cracks		None observed
Pavement Condition		N/A
Movement or Settlement of Crest		None observed
Lateral Movement		None observed
Vertical Alignment		Appears good
Horizontal Alignment		Appears good
Condition at Abutment and at Concrete Structures		Appears good
Indications of Movement of Structural Items on Slopes		Possible minor tilting of spillway intake structure
Trespassing on Slopes		Minor
Sloughing or Erosion of Slopes or Abutments		Minor erosion due to trespass
Rock Slope Protection-Riprap Failures		Minor displacement of riprap
Unusual Movement or Cracking at or Near Toes		None observed
Unusual Embankment or Downstream Seepage		No unusual seepage
Piping or Boils		None observed
Foundation Drainage Features		Filter blanket - toe wet
Toe Drains		below elevation 470±
Instrumentation System		N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Goss Brook Dam DATE 8/21/80

PROJECT FEATURE Principal Spillway BY PH, TS, ET, HM, AB

AREA EVALUATED	CONDITION
OUTLET WORKS-SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a) Approach Channel	N/A
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
b) Weir and Training Walls	
General Condition of Concrete	Good
Rust or Staining	None observed
Spalling	Very minor
Any Visible Reinforcing	None observed
Any Seepage or Efflorescence	None observed
Drain Holes	N/A
c) Discharge Channel	
General Condition	Good
Loose Rock Overhanging Channel	None observed
Trees Overhanging Channel	yes - channel through wooded area
Floor of Channel	Gravel
Other Obstructions	None observed

PERIODIC INSPECTION CHECK LIST

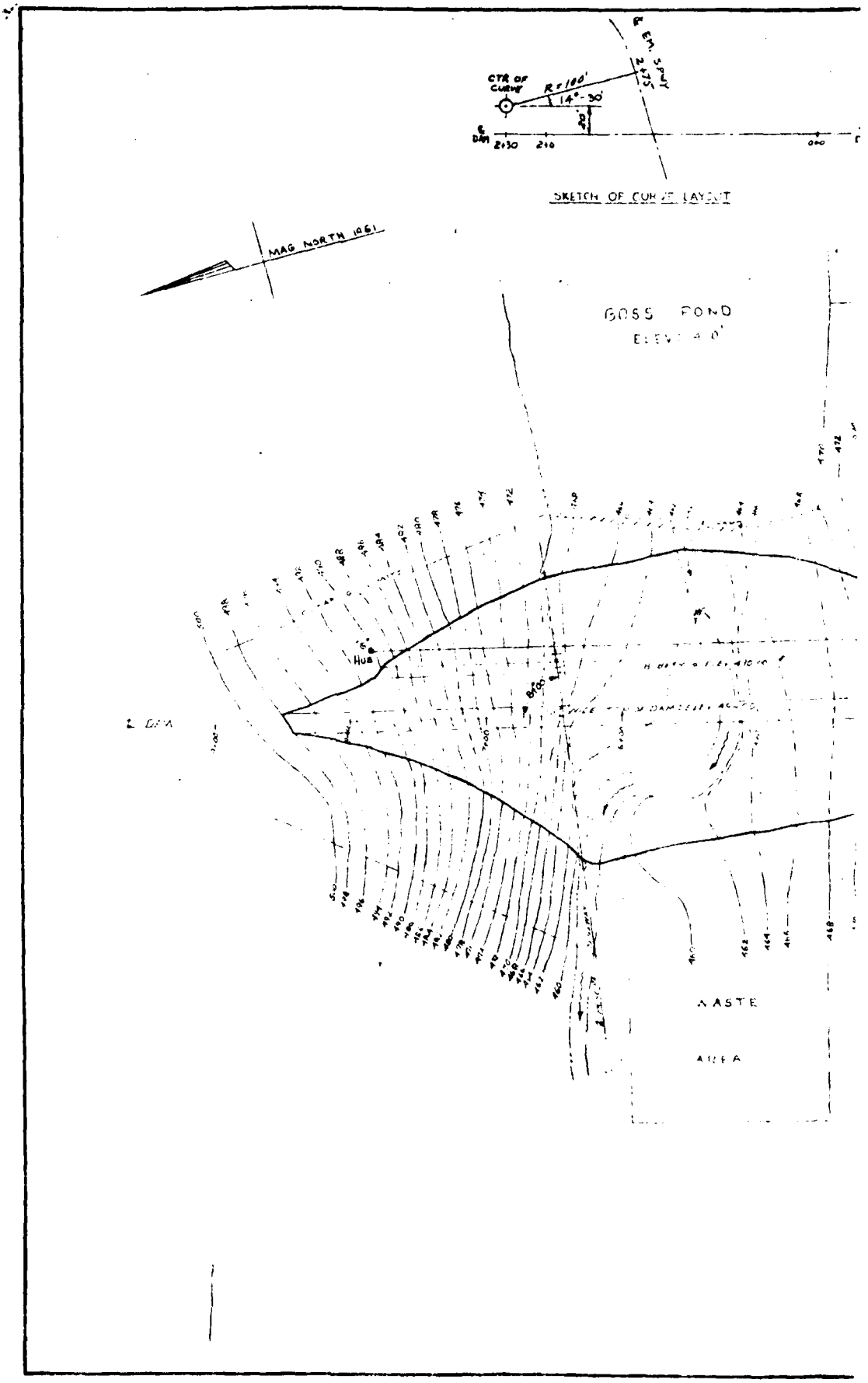
PROJECT Goss Brook Dam DATE 8/21/80

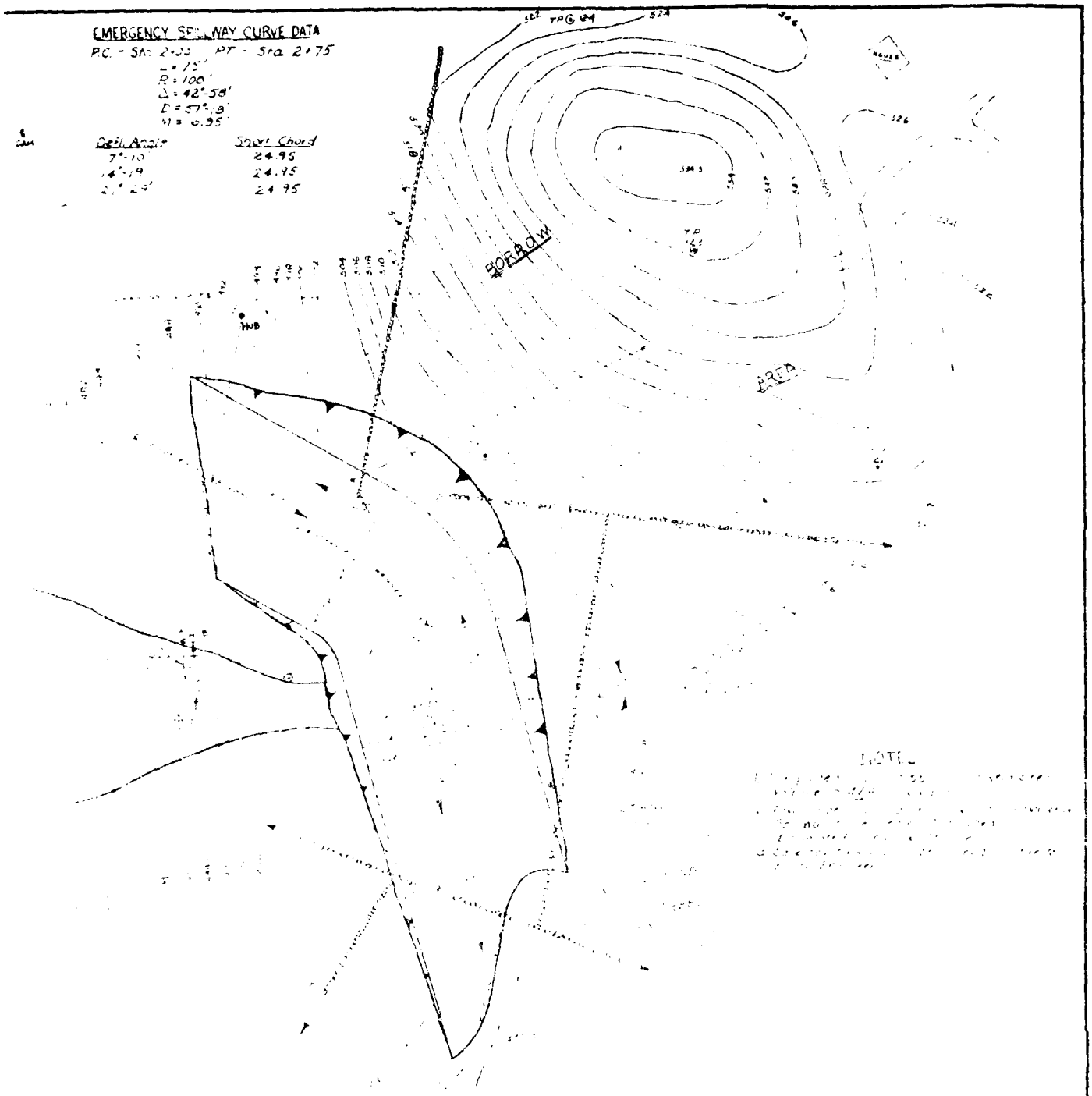
PROJECT FEATURE Emergency Spillway BY PH,TS,ET,HM,AB

AREA EVALUATED		CONDITION
OUTLET WORKS-SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS		
a) Approach Channel		
General Condition		Good
Loose Rock Overhanging Channel		No
Trees Overhanging Channel		No
Floor of Approach Channel		Grassed
b) Weir and Training Walls		
General Condition of Concrete		Spillway defined by nat'l slope to left and low berm to right, which are in good condition; however, there is some erosion due to trespassing & small trees on berm
Rust or Staining		
Spalling		
Any Visible Reinforcing		
Any Seepage or Efflorescence		
Drain Holes		
c) Discharge Channel		
General Condition		Good
Loose Rock Overhanging Channel		No
Trees Overhanging Channel		No, but discharges to wooded area.
Floor of Channel		Grassed
Other Obstructions		None observed

APPENDIX B

ENGINEERING DATA AND CORRESPONDENCE


CTR OF CURVE
R=100'
14°-30'
20'
℄ DAM
2+30
2+10
0+00
SKETCH OF CURVE LAYOUT
MAG NORTH 1961
GOSS POND
ELEV. 4.0'
HUB
℄ DAM
WASTE
AREA



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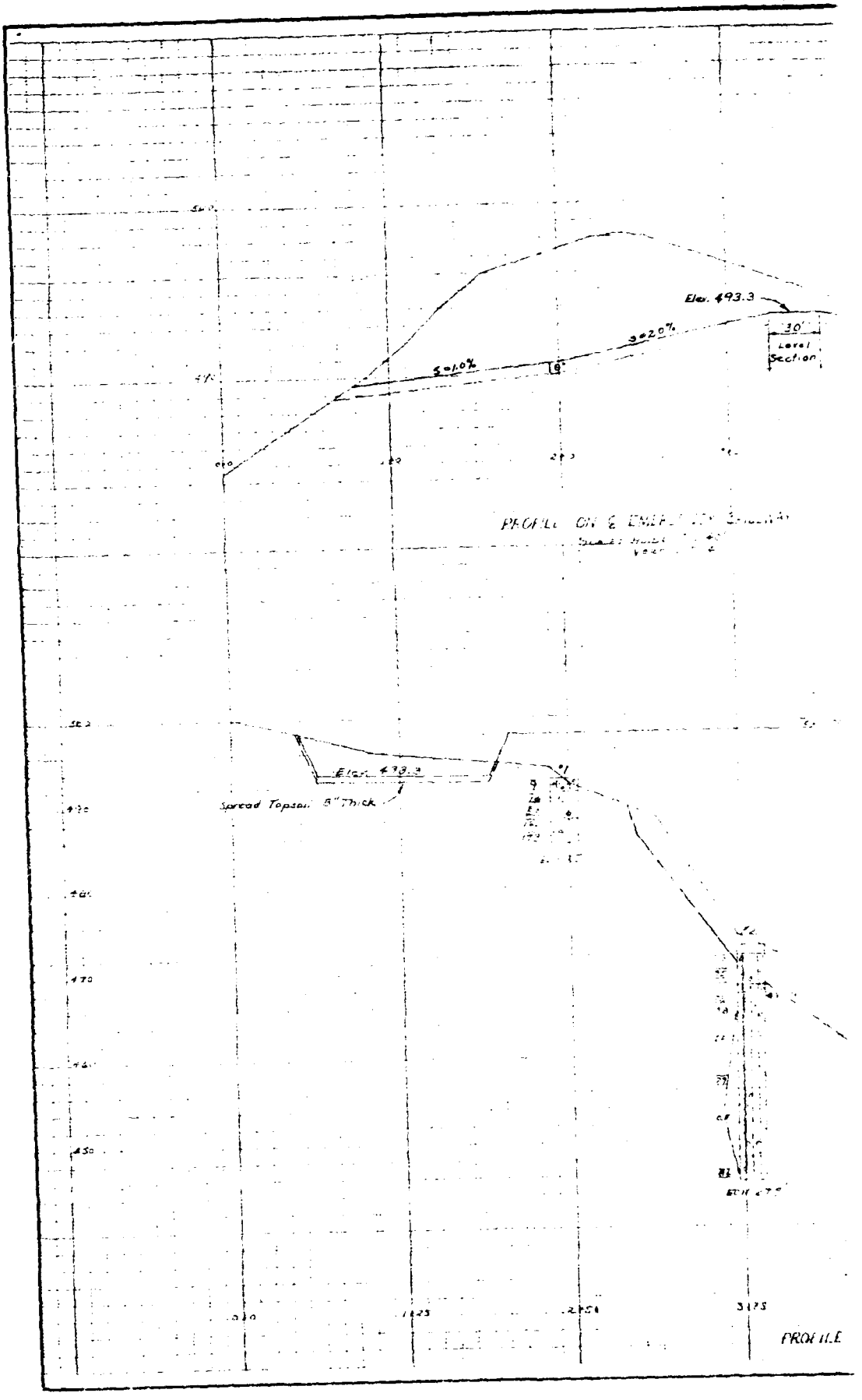
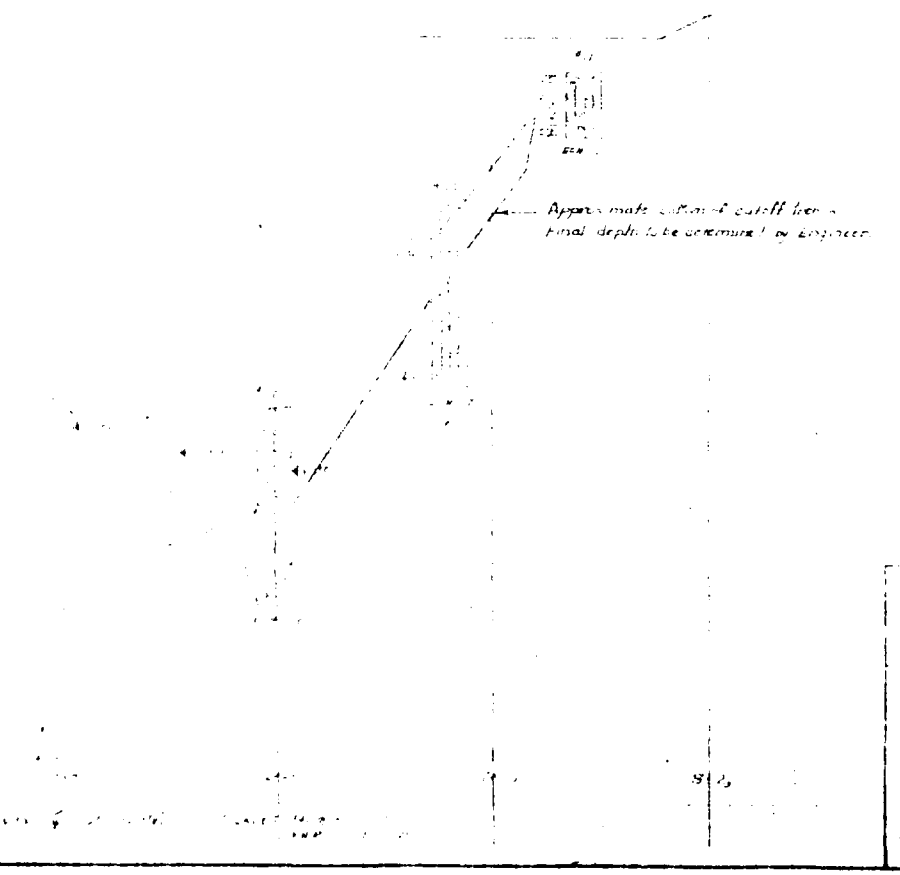
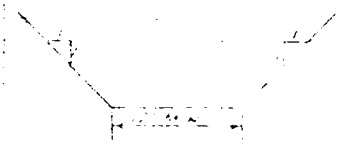
SOIL CONSERVATION SERVICE

2

Sheet 5 of


Elev. 493.3
30'
Level Section
S=2.0%
S=1.0%
Elev. 493.3
Spread Topsoil 6" Thick
PROFILE





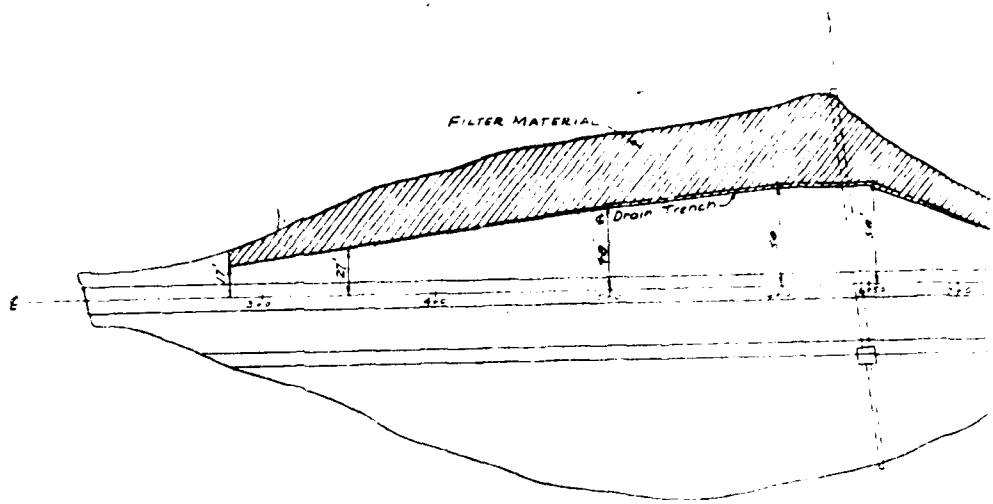
Typical Cross-Section of Cut-off Trench (not to scale)

ESTIMATED ELEVATION = 3400 ft.

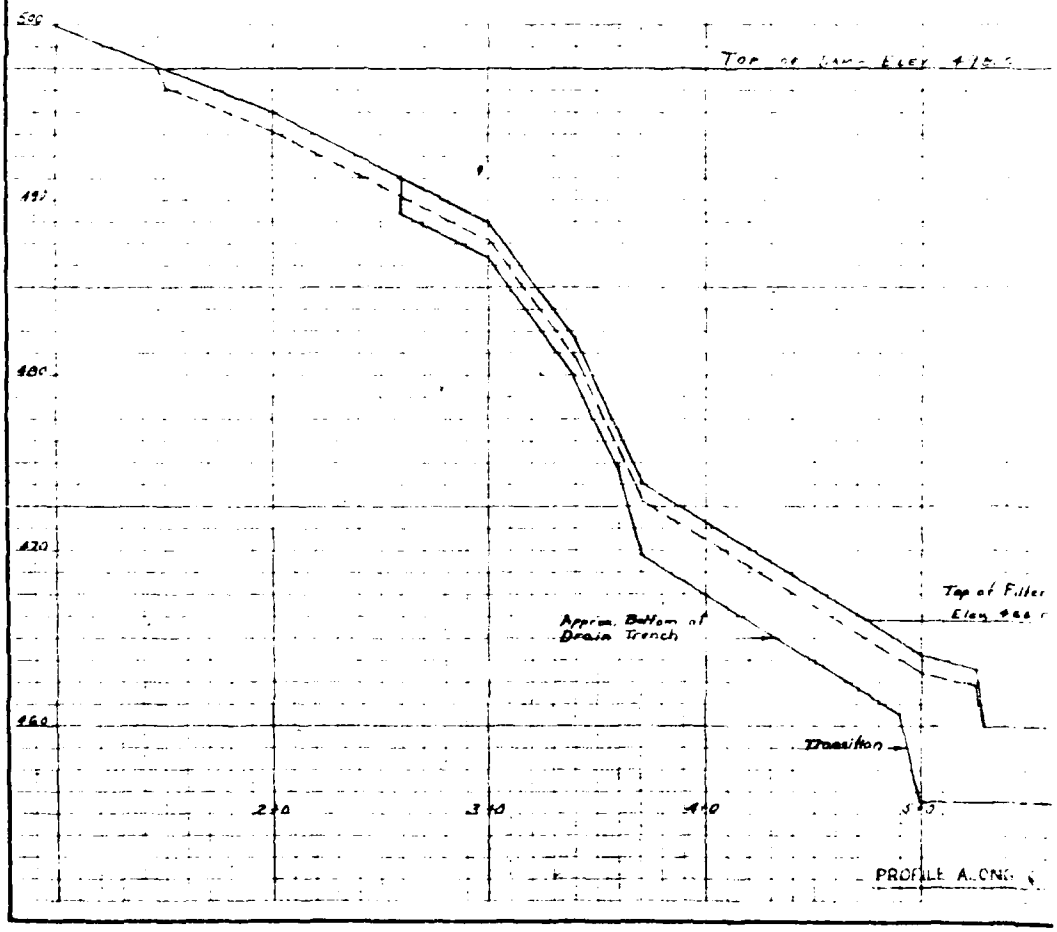
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SCS-N-50 P

Sheet B-2



PLAN VIEW OF SEEPAGE PATH
Scale: 1" = 5'



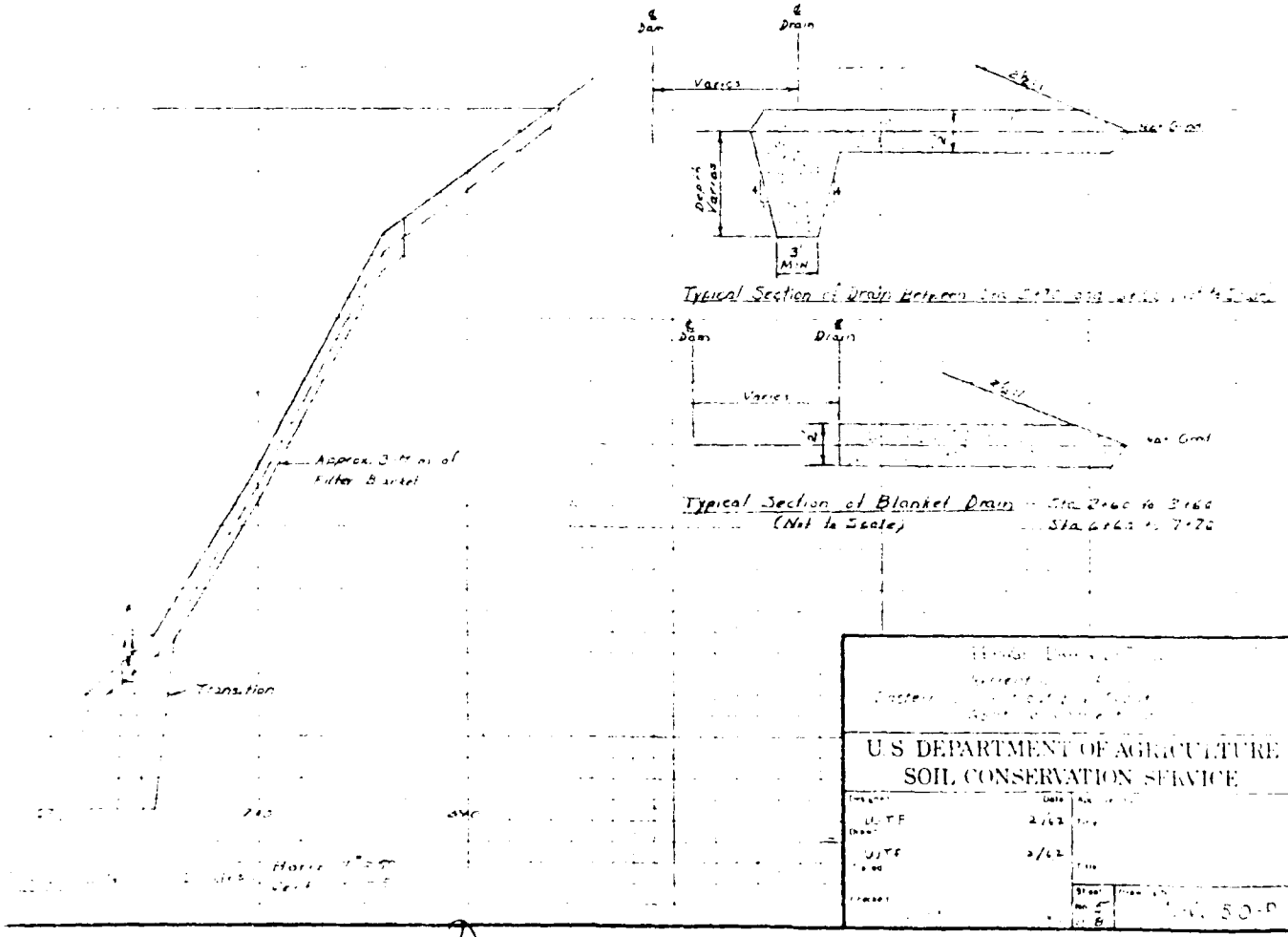
NOTES

1. Minimum depth of filter blanket = 2'
2. Filter material shall be so placed as to insure uniform gradation of the material and to avoid segregation.
3. Maximum depth of drainage trench to be determined in the field by the Engineer.

GRADATION OF FILTER MATERIAL	
SIEVE NO	% PASSING
3"	80-100
1"	64-87
¼"	53-76
#4	44-68
	28-48
#20	17-33
#40	10-23
#100	2-13
#140	1-9
#200	0-5

ESTIMATED QUANTITY = 700 C.Y.

ESTIMATED DRAIN EXCAVATION = 500 C.Y.



Typical Section of Drain Between Sta. 2+70 and Sta. 3+50

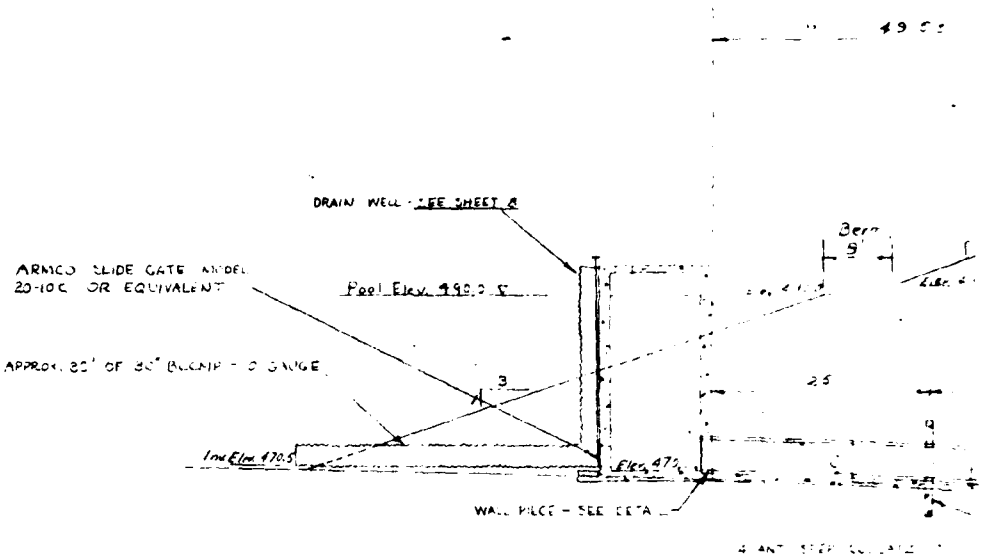
Typical Section of Blanket Drain (Not to Scale)

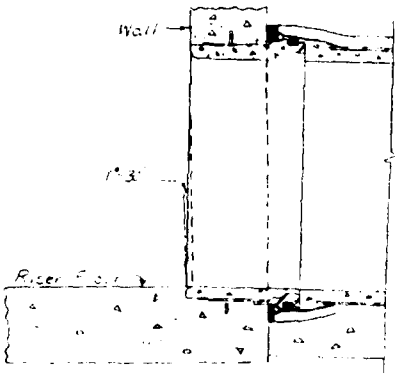
Sta. 2+60 to 3+60
Sta. 6+60 to 7+70

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

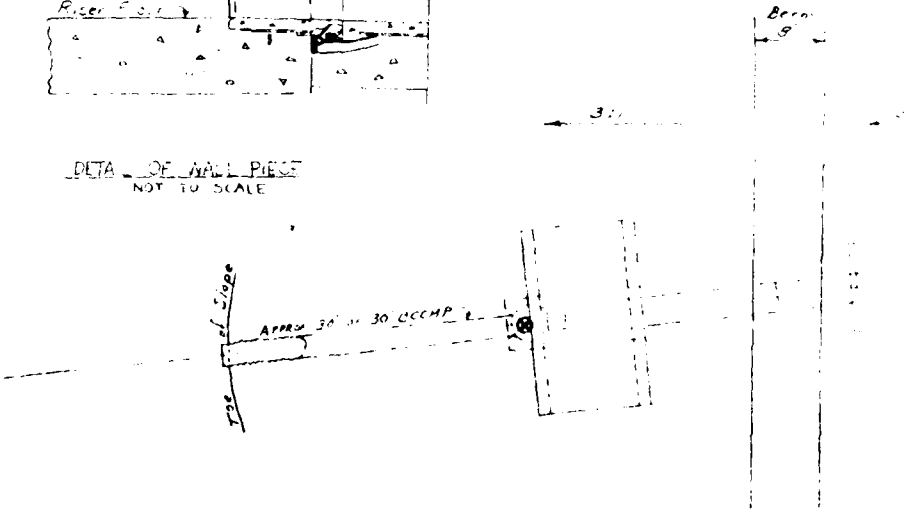
	Date
DESIGNED UTF	2/62
DRAWN UTF	2/62
CHECKED	
APPROVED	

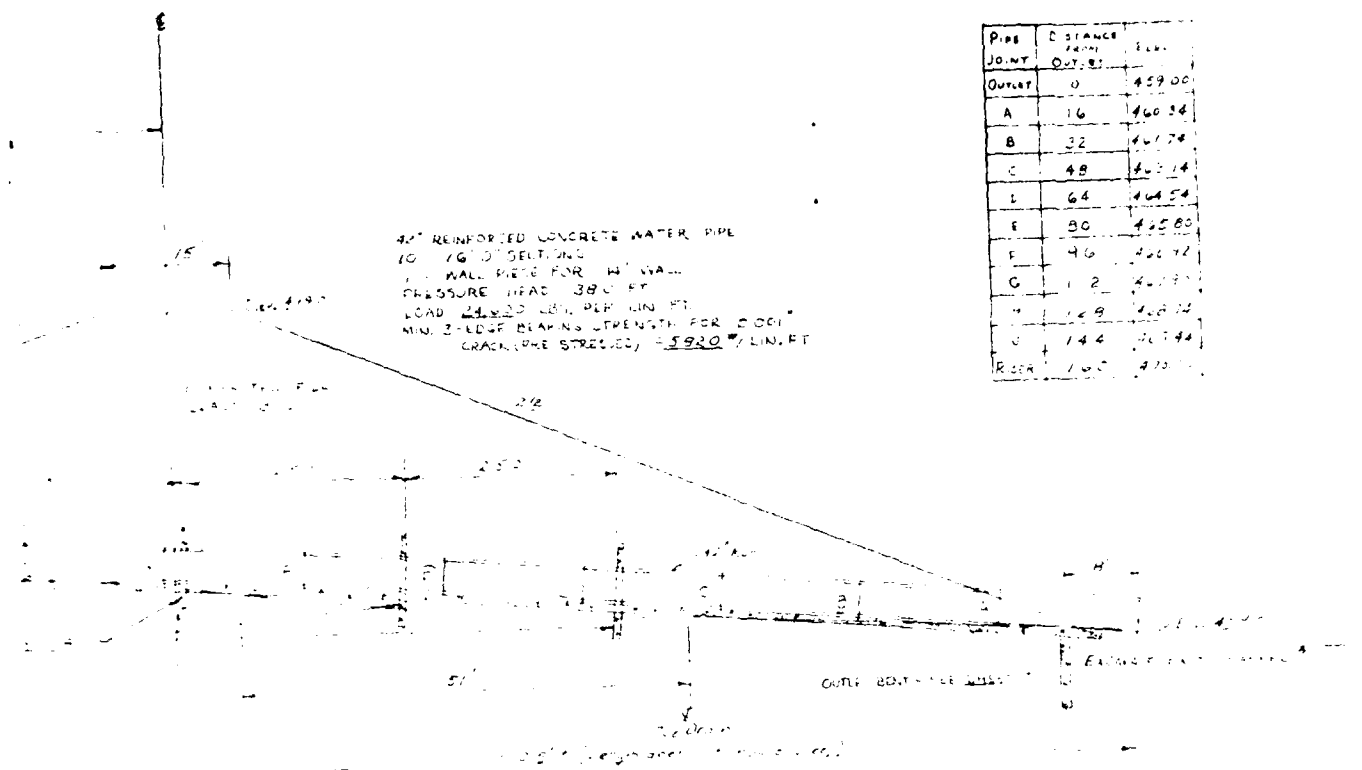
Sheet B-3



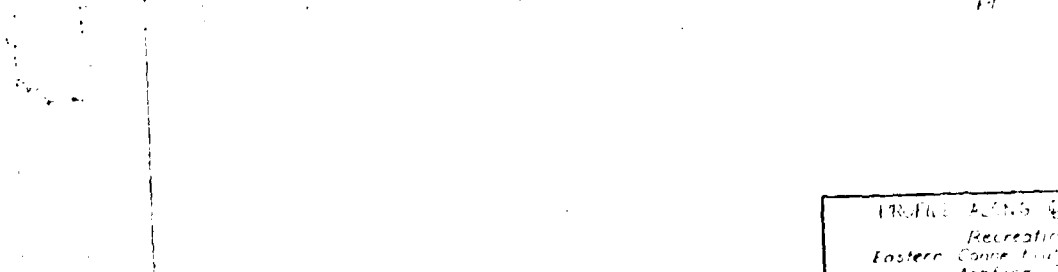


DETA OF WALL PIECE
NOT TO SCALE





PIPE JOINT	DISTANCE FROM OUTLET	ELEV.
OUTLET	0	459.00
A	16	460.34
B	32	461.74
C	48	463.14
D	64	464.54
E	80	465.80
F	96	466.72
G	112	467.52
H	169	468.14
I	144	467.44
RISER	160	470

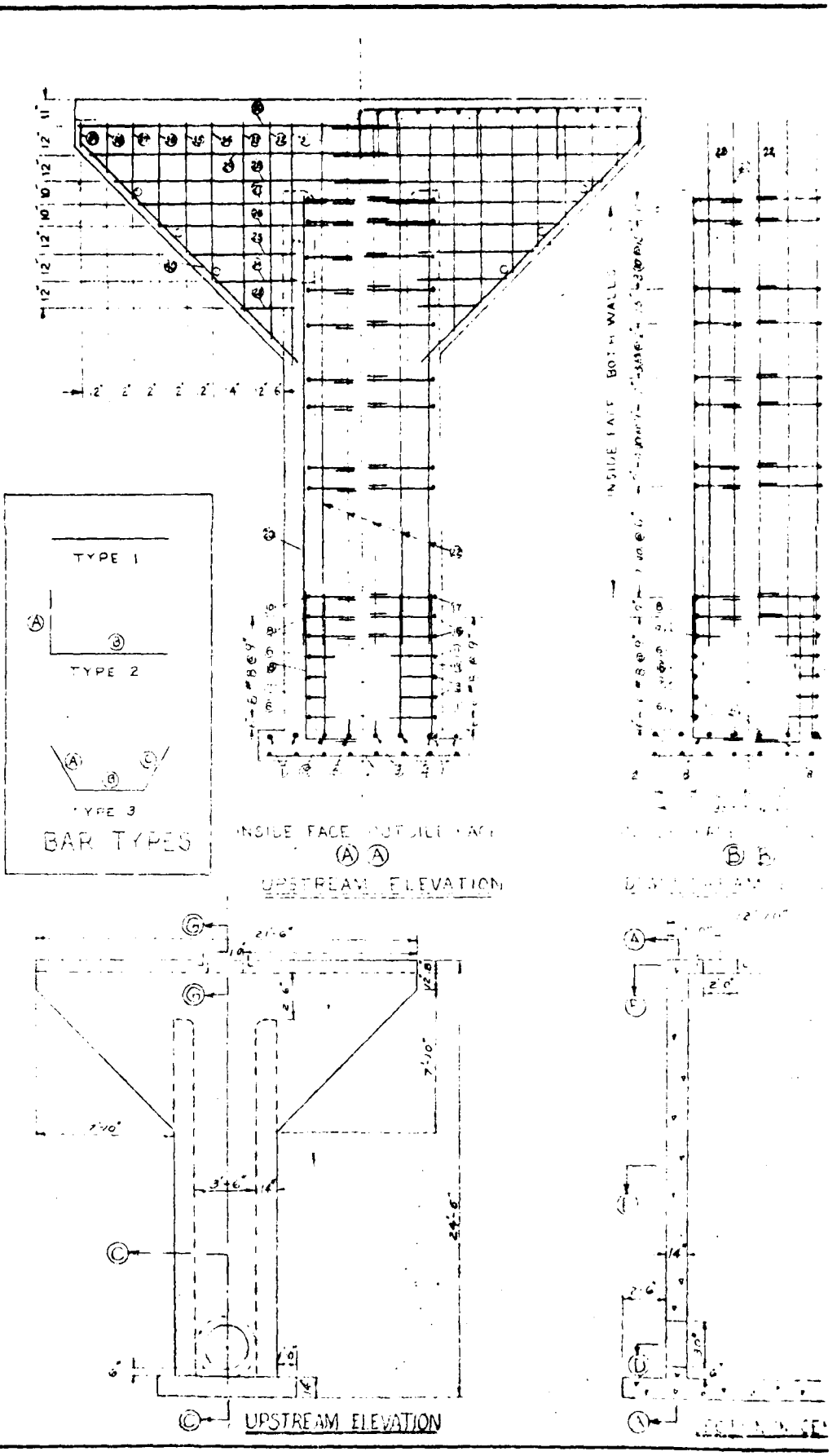


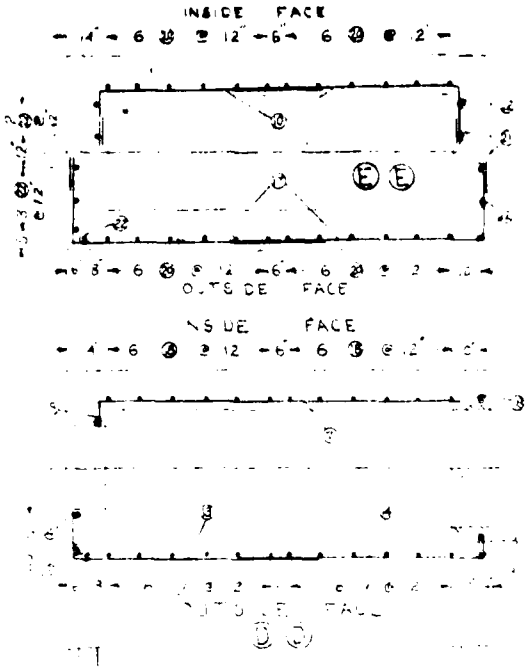
Recreation
Eastern Corn
Ashford

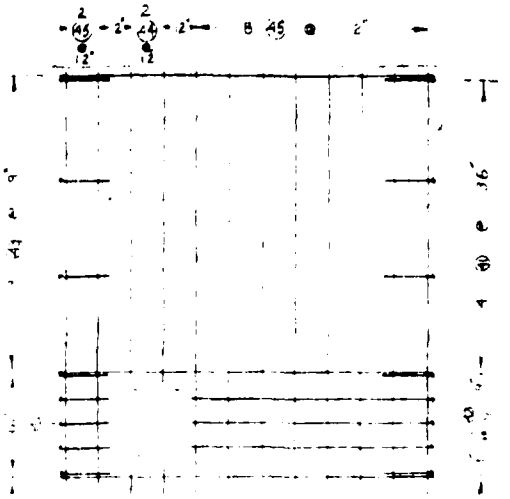
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

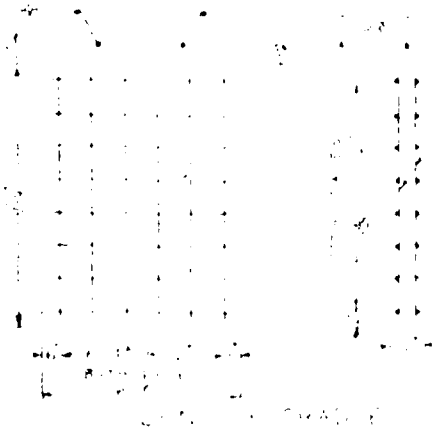
Designed	D.T.B	7/61
Drawn	W.T.F	8/61
Traced		
Checked		

Sheet B-4


TYPE 1
TYPE 2
TYPE 3
BAR TYPES
INSIDE FACE OUTSIDE FACE
UPSTREAM ELEVATION
UPSTREAM ELEVATION







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SOIL CONSERVATION SERVICE

Sheet B-5

GOSS BROOK DAM

EXISTING PLANS

Recreation Pond
Eastern Connecticut Boy Scout Council
Ashford, Connecticut

Designed By:
U.S. Department of Agriculture
Soil Conservation Service

Sheet 1	Cover Sheet
Sheet 2	Dam Site & Pond Area
Sheet 3	Dam Site
Sheet 4	Profiles & Soils Data
Sheet 5	Seepage Drain Details
Sheet 6	Profile on Center Line Princ. Spillway
Sheet 7	Structural Steel Details
Sheet 8	Structural & Steel Details

SUMMARY OF DATA AND CORRESPONDENCE

DATE	TO	FROM	SUBJECT	PAGE
Aug. 27, 1962	William S. Wise	E. B. Cornell Scout Executive Eastern Conn. Council	Start of construction	B-2
Sept 27, 1962 to June 6, 1963	Water Resources Comm.	H.R. Hoffman, P.E. A. J. Macchi Engineers	Construction inspection reports - reports dated 9/27/63, 10/30/62, 11/6/62, 11/20/62, 12/17/62, 5/8/63, 6/6/63	B-23
June 29, 1963	Water Resources Comm.	H.D. Barnes Eastern Conn. Council	Completion of dam	B-30
July 8, 1963	Water Resources Comm.	H.R. Hoffman	Erosion at toe due to surface runoff	B-31
July 9, 1963	H.R. Hoffman	T.R. Wire	Control of erosion	B-32
Oct. 10 1963	Water Resources Comm.	H.R. Hoffman	Recommendation for issuance of Certificate of Approval	B-33
Oct. 23, 1963	Water Resources Comm.	H. R. Hoffman	Recommendation to monitor spillway structure for movement.	B-34
Aug. 27, 1971	Macchi & Hoffman Engineers	William H. O'Brien, III Water Resources Comm.	Request to inspect dam	B-35
Sept 2, 1971	Eastern Conn. Council	H. R. Hoffman	Inquiry about the establishment of monitoring program	B-36
Sept 15, 1971	Water Resources Comm.	H.R. Hoffman	Inspection report	B-37
Sept. 23, 1971	Eastern Conn. Council	John J. Curry Director, Water Resources Comm.	Certificate of Approval	B-38

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Old Bookstore Building
Route 195
Storrs, Connecticut

August 10, 1961

Mr. William Wise
Connecticut State Water Resources
Commission
State Office Building
Hartford, Connecticut

Boy [illegible]

Dear Mr. Wise:

We are in the process of preparing plans for a dam and a lake for Eastern Connecticut Council for Boy Scouts. The proposed site is just downstream from the existing Goss Pond in Ashford.

This dam will be designed under the basic criteria as established by our Washington Memo 27 or more restricting criteria as may be established by local agencies.

The hazzard class is tentatively set as "B" since the closest public utility is the Mount Hope River Bridge located about 1.4 miles below the Site on Rt. 89. It also appears unlikely that this downstream area will be developed.

We would like to have your comments, suggestions and proposals for any necessary changes in criteria before we complete the hydraulic design.

The preliminary geological investigations has been completed and we have recommended drilling for further study. No problems are anticipated.

Tabulated below is the basic data on this site:

Watershed	1.81 sq. mi.
Existing Goss Pond	6.3 acres
Existing Goss Pond Elevation	470
Proposed Pond Elevation	495 ±
Height of Fill	40' +
Spillway, Concrete Pipe	30"

Hydrograph Data	Peak Flow C.F.S.	Rainfall inches	Runoff inches
Principle Spillway, 70 year frequency	656	5.0	2.11
Emergency Spillway	2376	9.6	5.98
Freeboard	3935	14.4	10.44

Flood routing will be done on same principle as used on all flood control structures.

If we can provide further information for preliminary consideration, or meet with you to review data, or look over the site, please let us know.

Sincerely yours,

T. R. Wire,
State Conservation Engineer

COPY

JOHN J. MOZZOCHI AND ASSOCIATES
CIVIL ENGINEERS

GLASTONBURY, CONN.
217 HEBRON AVENUE
PHONE MEDFORD 3-8401

PROVIDENCE 3, R. I.
200 DYER STREET
PHONE GASPEE 1-0420

JOHN J. MOZZOCHI
ASSOCIATES
OWEN J. WHITE
JOHN LUCHS, JR.
ECTOR L. GIOVANNINI

REPLY TO: Glastonbury

August 23, 1961

Mr. T. R. Wire
State Conservation Engineer
U.S. Soil Conservation Service
Old Bookstore Building
Storrs, Connecticut

Boy Scouts Pond
Ashford

Dear Mr. Wire:

Your letter of August 10, 1961 to Mr. Wise of The Connecticut State Water Resources Commission, has been forwarded to this office for review and comment. It is my understanding that you wish to have a general review of the design principles prior to starting detailed drawings and that the detailed plans, specifications and computations will be forwarded for review in the usual manner when completed. With this in mind, the following comments are made to guide you in the detailed design:

a. Your letter establishes a tentative hazard classification of Class "B" as described in S.C.S. Memo No. 27. The various design floods given in your letter are in excess of those specified in Memo No. 27 for Class "B", but somewhat less than those specified for Class "C". Rather than try to establish a fixed hazard classification, it would be preferable to simply not specify any particular fixed classification, but to establish the flood flows that appear to be required.

b. The basic data listed in your letter appears to be correct but will presumably be subject to change by you if necessary in the detailed design.

c. The principal spillway should be of a size capable of handling "normal" floods occuring with relative frequency (to be expected more than once or twice during the life of the structure.) For this type of structure a frequency of 50 to 100 years would be acceptable. The peak flow of 656 C.F.S. (364 C.F.S./sq. mi.) given in your letter appears to satisfy this criteria. Naturally, this flood criteria can be applied only to those cases where there is an emergency spillway to supplement the principal spillway.

d. The emergency spillway should be capable of handling the maximum flood to be reasonably expected. This has generally been taken as a flood on the order of the higher runoffs experienced during the "Diane" storms of 1955.

Your value of 2376 C.F.S. (1310 C.F.S./Sq. Mi.) is satisfactory in this respect. It is expected that the emergency spillway capacity will be approacned only once or twice during the life of the structure, however, there will be more frequent smaller flows which should be borne in mind when designing this spillway.

e. Freeboard should be provided above the maximum high water from the emergency spillway design flood to allow for the maximum conceivable runoff. Rather than establishing a freeboard design flood as given in your letter, it has been the practice to provide two feet of freeboard above the emergency spillway design flood high water.

f. Due to the proposed use of this pond for a Boy Scout camp, it might be advisable to provide some extra assurance that the emergency spillway will not be blocked or altered in any way by future construction. Perhaps some special signs permanently posted at the spillway might be in order.

We will be happy to discuss any of this information with you at any time, also it might be adviseable to visit the site together after the geologic investigations have been completed and your design has been pretty well fixed. Please call us at that time to arrange this inspection.

Very truly yours,

John J. Muzzochi and Associates
Civil Engineers

WJMF:hk

cc: Mr. Wise-Water Resources

FORM D-

STATE OF CONNECTICUT
WATER RESOURCES COMMISSION
State Office Building
Hartford, Connecticut

APPLICATION FOR CONSTRUCTION PERMIT FOR DAM

Owner Eastern Conn. Council, Inc. Date May 14, 1962
Boy Scouts of America
P.O. Address 126 Broadway
Norwich, Conn.

Ref. No TU 7-2276

Location of Structure:

Town Ashford Shown on USGS Quadrangle Westford
Revision 1952 scale 1:24000

Name of Stream Goss Brook at 7 inches south of Lat. 41°55'
and 2 inches east of Long. 72°10'

Directions for reaching site from nearest village or route intersection:
(see sketch on reverse side)

From the junction of Routes 89 and US 44 at Warrenville go East 1 3/16 miles and turn left on gravel road. Follow gravel road about 3000 feet, turn right on drive 400 feet to house. Thence Northwest 900 feet to site.

This is an application for: (New Construction) X (Alteration) (Repair) (Removal)
(check one or more of above)

This pond is to be used for: Recreational purposes

Dimensions of Pond: width 600' length 2000 feet area 24 acres

Maximum depth of water immediately above dam: 28 feet

Total length of dam 650 feet

Length of spillway: 42 inch diameter

Height of dam from top of spillway:

Type of spillway construction: Reinforced concrete tower with 42" RFC pipe outlet

Type of dike construction: Compacted earth

Spillway section will be set on: (Bedrock) (Gravel) (Clay) (Fill) X
(check one of above)

Remarks: In addition to concrete spillway tower, plans require large emergency spillway around dam.

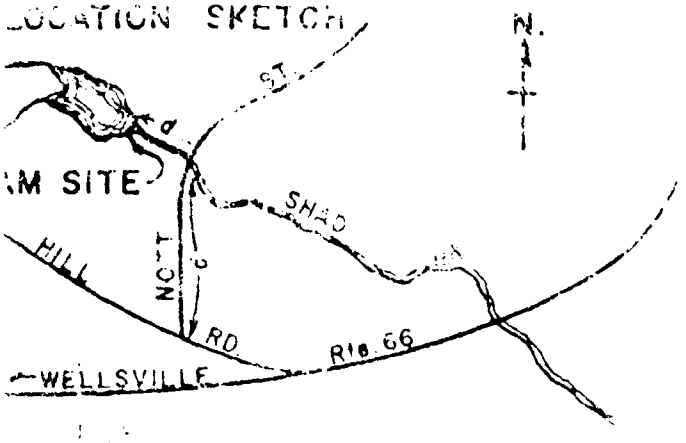
Signed: John H. Smith
for Eastern Conn. Council, Inc. B.S.A.
(owner)

Name of Engineer, if any John H. Smith

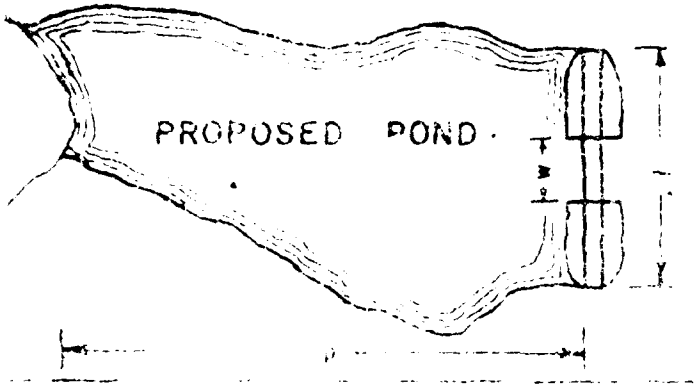
Note: Show details of construction on reverse side.

SAMPLE DATA

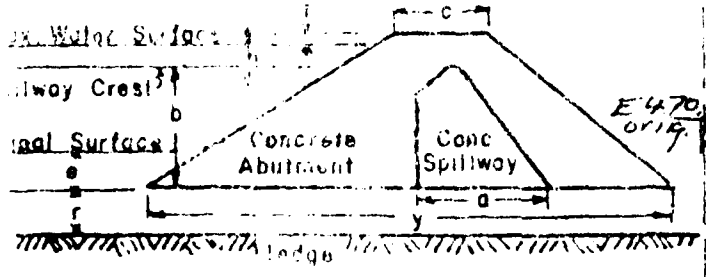
LOCATION SKETCH



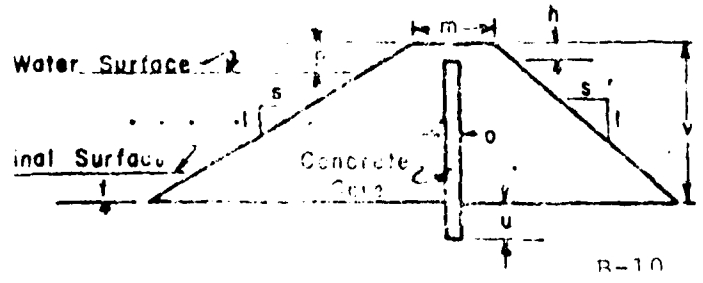
SITE PLAN



SPILLWAY SECTION



DIKE SECTION

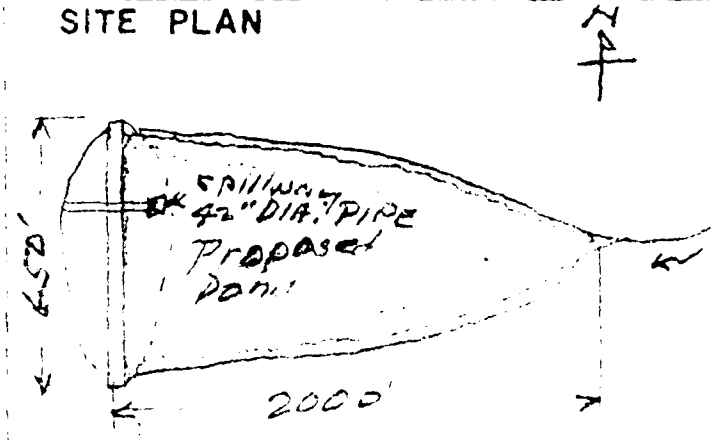


APPLICANT'S DATA

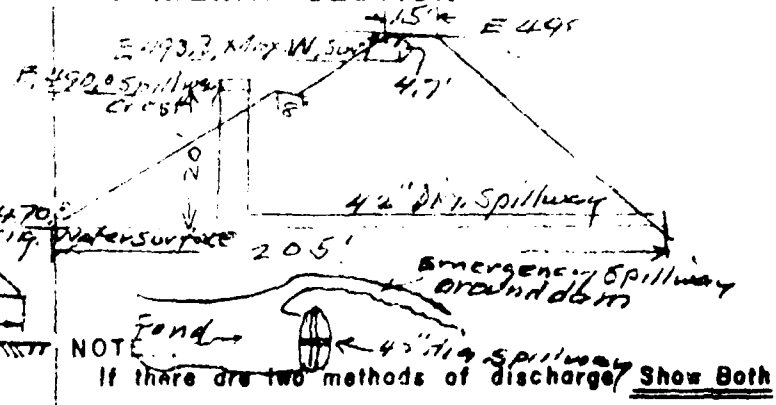
Show only features of sample which are applicable and dimensions which reflect your intent.

LOCATION SKETCH

SITE PLAN

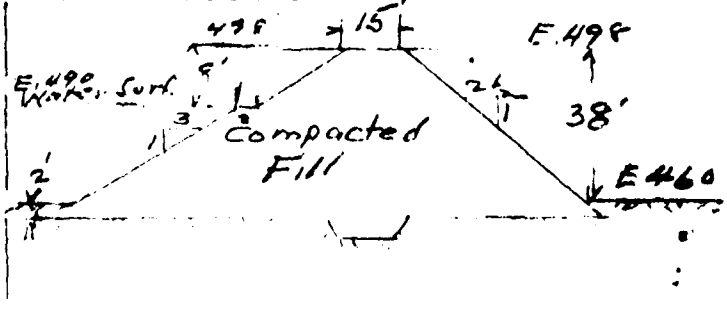


SPILLWAY SECTION



NOTE If there are two methods of discharge, Show Both

DIKE SECTION



Old Bookstore Building
Route 195, Storrs, Connecticut

May 29, 1962

Mr. A. J. Macchi, Civil Engineer
44 Gillette Street
Hartford, Connecticut

Dear Mr. Macchi:

With regard to a telephone conversation with your office on May 28th, we regret that additional copies of the Hydrology section of our National Engineering Handbook series are not available at this time. However, if you have further questions on our method of hydrologic evaluation of a watershed, we would be happy to meet with you here at any time, to discuss these questions. Water Resources have copies of all of these National Engineering Handbooks.

As to your review of the plans for the proposed Boy Scout Pond Dam at Ashford, we assume that the Water Resources Commission forwarded to you, in addition to the design data, copies of correspondence between this office and that of John Mozzochi and Associates of Glastonbury. The comments contained therein were incorporated in the development of the final plans for this dam, and to the best of our knowledge we have adhered to design criteria acceptable to the Water Resources Commission.

Data for development of the hydrographs are as follows:

Boy Scout Pond

	Rainfall inches	Runoff inches	Peak Discharge cfs.
Principal Spillway	5.0	2.11	656
Emergency Spillway	9.6	5.98	2380
Freeboard Hydrograph	14.4	10.44	3900

You will note that storms were routed from the Ashford Lake to develop hydrology for the Boy Scout Pond.

You will also note that in accord with Mr. Mozzochi's letter we added two feet for freeboard to the design stage for the emergency spillway rather than use the minimum as defined by the freeboard hydrograph.

Sincerely,

T. R. Wire
State Conservation Engineer

cc: W. Wise
J. Smith

June 13, 1962

Soil Conservation Service
United States Dept. of Agriculture
Old Bookstore Building
Route 195
Storrs, Connecticut

Re: Goss Brook Dam
for Eastern Conn. Boy
Scout Council
Ashford, Connecticut

Gentlemen:

This office was engaged as a consultant by the Water Resources Commission, State of Connecticut to review Plans and Specifications for the above Dam which was designed by your office.

It is our opinion that the following items should be considered prior to the issuance of a construction permit:

1. In order to prevent erosion at the inside corner of the intersection between the emergency spillway and upstream face of the dam either, (a) provide rip-rap or, (b) straighten the alignment of the emergency spillway.

2. Provide rip-rap at each end of the principal spillway.

3. Increase the size of the base under the intake structure to provide greater stability.

Soil Conservation Service
United States Dept. of Agriculture
Storrs, Connecticut

June 13, 1962

4. Show boring legend on Contract Drawings.

5. Incorporate material gradation curves for borrow material into contract specifications to facilitate inspection of construction.

Very truly yours,

A. J. MACCHI, ENGINEERS

A. J. MACCHI

cc. State of Connecticut
Water Resources Commission
State Office Building
Hartford, Connecticut

cc: Water Resources Commission

Old Bookstore Building
Storrs, Connecticut

June 19, 1962

A. J. Macchi
A. J. MACCHI, ENGINEERS
44 Gillett Street
Hartford, Connecticut

Re: Goss Brook Dam
Eastern Conn. Boy
Scout Council
Ashford, Conn.

Dear Mr. Macchi:

With reference to your letter of June 13, 1962, the following discussion paragraphs are numbered the same as in your letter:

1. These grassed emergency spillways are designed in accordance with service criteria previously approved by the Water Resources Commission. This criteria requires that the exit channel be straight with only a few exceptions and that the maximum velocity will not exceed specified limiting velocities for vegetation.

   The entrance channel has a reverse grade which results in very low velocities. Because of this, when topography and economy dictate the entrances have been curved. For example:

Emergency discharge	=	1350 cfs.
Cross section area at 2+00	=	675
Average velocity	=	2 feet per second

   There appears to be no reason to rip-rap this spillway. With the probability of very infrequent use, I feel the criteria under which these spillways are designed is very conservative.

2. A berm is provided at normal pool elevation which provides some protection against wave action. Rip-rap would also be desirable in this

area. It hereby is recommended to Mr. Smith that this berm area be rip-rapped; also the embankment slope to an elevation of two feet above normal pool elevation; also the embankment slope in the area of the outlet conduit.

3. Moran, Proctor, Meiser, and Rutledge of New York made an extensive nation-wide investigation of our drop inlet-pipe spillways because of problems with the conduits on foundations with high consolidation potential. No question has ever been raised regarding these risers. In twenty-five years I have not observed any stability problems and most of these risers have gone in without spread footings. I will be interested in examining a loading analysis that indicates these risers are not stable.

4. Omission of boring legend was an oversite and should have been noted in our office - this and other omissions will be added to tracings and if Mr. Smith has printed contract plans, these omissions will be covered in this letter and supplemental material provided to Mr. Smith.

5. Gradation curves are a part of our Geological Report and available for inspection. At time of construction, proctor curves will be determined and several field density tests will be run for Mr. Smith.

Please let us know if we can provide further information on this plan. Mr. Smith is anxious to have this plan presented to the next meeting of the Commission.

Very truly yours,

T. R. Wire
State Conservation Engineer

cc: Water Resources Commission
John Smith, Phoenixville

Old Bookstore Building
Storrs, Connecticut

June 19, 1962

Mr. John Smith
Phoenixville, Conn.

Dear Mr. Smith:

Attached is a copy of a letter to Mr. A. J. Macchi, Consultant for Water Resource Commission.

There are several points made in the review that call for minor revision of the plans. If you do not have your contract prints at this time, we will make the suggested revisions on the tracings if you will return them to this office. Otherwise, you should make a modification of your contract on the following points:

1. Rip-rap the berm at normal pool elevation and the slope to two feet above normal pool.

2. Rip-rap the embankment slope in the area of the principal spillway outlet.

3. Attached are copies of the boring legend.

4. As was originally promised, we will provide some assistance on making field density test.

Very truly yours,

T. R. Wire
State Conservation Engineer

cc: A. J. Macchi
Water Resources Commission

June 22, 1962

Soil Conservation Service
U.S. Dept. of Agriculture
Old Bookstore Building
Route 195
Storrs, Connecticut

Re: Cross Brook Dam
Eastern Conn. Boy
Scout Council
Ashford, Conn.

Gentlemen:

Reference is made to your letter of June 19, 1962 which was written in reply to our letter of June 13, 1962. Our comments are as follows:

1) With regard to preventing erosion at the inside corner of the intersection between the emergency spillway and the upstream face of the dam, it is our opinion that while the average velocity may only be 2 feet per second, higher velocities can be expected at this inside corner due to the curvature in the alignment of the emergency spillway channel. While this may be somewhat of an academic question and subject to debate, in our judgment rip-rap should be provided.

2) It is our considered opinion that provision of a larger base under the intake structure would greatly improve its structural stability at little cost increase. It appears to be good design judgment in light of the unknown factors such as soil conditions and possible unbalanced loading due to ice.

Very truly yours,

A. J. MACCHI, ENGINEERS

A. J. MACCHI

cc. Water Resources Comm.
State of Conn.

A. J. MACCHI • ENGINEERS
DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-8631
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

June 22, 1962

State of Connecticut
Water Resources Commission
State Office Building
165 Capitol Avenue
Hartford, Connecticut

Re: Goss Brook Dam
Eastern Conn. Boy
Scout Council
Ashford, Conn.

Gentlemen:

We have reviewed the design of the above-referenced and had a discussion with the Bureau of Reclamation and reccomend that a construction permit be granted.

Very truly yours,

A. J. MACCHI, ENGINEERS

A. J. MACCHI

STATE OF CONNECTICUT
WATER RESOURCES COMMISSION
STATE OFFICE BUILDING - HARTFORD 15, CONNECTICUT

July 17, 1962

CONSTRUCTION PERMIT FOR DAM

Eastern Connecticut Council
Boy Scouts of America
126 Broadway
Norwich, Connecticut

Gentlemen:

Your application for Construction Permit dated May 9, 1962, for the construction of an earth dam on your property on Goss Brook in the Town of Ashford in accordance with plans marked CN-W-50-P, consisting of 8 sheets, and technical specifications prepared by the Soil Conservation Service, U. S. Department of Agriculture has been considered and the construction described therein is hereby approved only under the following conditions:

1. The Commission shall be notified

   A) When construction is started
   B) When foundation is excavated
   C) When the dam is completed and before water is impounded
   D) When project is completed and ready for final inspection

This permit, with the attached set of plans and specifications, must be kept at the site of the work and made available to the Commission at any time during the construction. This permit covers the construction as described in the attached documents. If any changes are contemplated, the Commission must be notified and supplementary approval obtained.

If the construction authorized by this construction permit is not started within two years of the date of this permit and completed within four years of the same date, this permit must be renewed.

Your attention is directed to Section 25-115 of the 1958 Revision to the General Statutes -"Liability of owner or operator. Nothing in this chapter and no order, approval or advice of the Commission or a member thereof, shall relieve any owner or operator of such a structure from his legal duties, obligations and liabilities resulting from such ownership or operation. No action for damages sustained through the partial or total failure of any structure or its maintenance shall be brought or maintained against the state, a member of the Commission or the Commission, or its employees or agents, by reason of supervision of such structure exercised by the Commission under this chapter."

The Commission cannot convey or waive any property right in any lands of the State, nor is this permit to be construed as giving any property rights in real estate or material or any exclusive privileges, nor does it authorize any injury to private property or the invasion of private rights or any infringement of federal, state or local laws or regulations.

Your attention is also directed to Section 26-134 of the 1958 Revision of the General Statutes -"Obstructing Streams. No person shall, unless authorized by the director, prevent the passing of fish in any stream or through the outlet or inlet of any pond or stream by means of any rack, screen, weir or other obstruction or fail, within ten days after service upon him of a copy of an order issued by the Director, to remove such obstruction." The address of the State Board of Fisheries and Game is State Office Building, Hartford, Connecticut.

Very truly yours,

William S. Wise
Director

WSW:js
Enclosures

cc: Town Clerk Ashford
Mr. T. R. Wire
Mr. A. J. Macchi

Boy Scouts of America

EASTERN CONNECTICUT COUNCIL, INC. # 76

126 BROADWAY — NORWICH — CONNECTICUT — 887-2276

STRENGTHEN AMERICA
Character Counts

August 27, 1962

STATE WATER RESOURCES COMMISSION
RECEIVED
AUG 28 1962
ANSWERED .....
REFERRED .....
FILED .....

Mr. William A. Wise, Director
Water Resources Commission
State of Connecticut
State Office Building
Hartford 15, Connecticut

Dear Mr. Wise:

In accordance with your letter of July 17, 1962 "Construction Permit for Dam", on our property on Goss Brook in the Town of Ashford, we wish to advise you that construction was started during the week of August 13, 1962.

Upon the foundation is excavated, notification will again be given.

Sincerely yours,

BOY SCOUTS OF AMERICA

E. B. Cornell

E. B. Cornell
Scout Executive

EBC/md.

A. J. MACCHI • ENGINEERS

DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-6631
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

September 27, 1962

State of Connecticut
Water Resources Commission
State Office Building
165 Capitol Avenue
Hartford, Connecticut

Re: Dam on Goss Brook
Ashford, Connecticut

Gentlemen:

Please be advised that I visited the above project on Wednesday, September 26, 1962. Mr. Longo and Mr. Smith representing the Eastern Connecticut Council, Boy Scouts of America were present.

Contractor has recently completed installation of the Principal Spillway pipe and was excavating for the cutoff trench in the downstream face of the dam. Borrow area has been stripped of topsoil and material appears to be satisfactory. There were no problems to be discussed. All work was satisfactory.

Very truly yours,

A. J. MACCHI, ENGINEERS

H. R. HOFFMAN, P. E.

A. J. MACCHI • ENGINEERS
DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-6631
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

October 30, 1962

State of Connecticut
Water Resources Commission
State Office Building
165 Capitol Avenue
Hartford, Connecticut

Re: Dam on Goss Brook
Ashford, Conn.

Gentlemen:

Please be advised that I visited the above project on Tuesday, October 30, 1962. Contractor was placing earthfill for the dam. He had two scrapers and two bulldozers working on this operation. In addition, there were four men erecting forms for the concrete water intake structure.

All work appeared to be satisfactory.

Very truly yours,

A. J. MACCHI, ENGINEERS

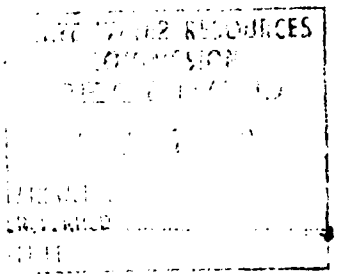
H. R. HOFFMAN, P. E.

A. J. MACCHI • ENGINEERS
DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-8631
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

November 6, 1962



State of Connecticut
Water Resources Commission
State Office Building
165 Capitol Avenue
Hartford, Connecticut

Re: Dam on Goss Brook
Ashford, Conn.

Gentlemen:

Please be advised that I visited the above project on Tuesday, November 6, 1962. Mr. Longo, representing the Eastern Connecticut Council Boy Scouts of America was present.

Contractor was placing earthfill for the dam. In addition, he was erecting forms for the upper part of the concrete water intake structure.

All work appeared to be satisfactory.

Very truly yours,

A. J. MACCHI, ENGINEERS

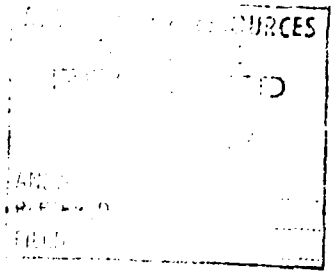
H. R. HOFFMAN, P. E.

A. J. MACCHI • ENGINEERS
DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-6631
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

November 20, 1962



State of Connecticut
Water Resources Commission
165 Captiol Avenue
Hartford, Connecticut

Re: Dam on Goss Brook
Ashford, Connecticut

Gentlemen:

Please be advised that I visited the above project on Tuesday, November 20, 1962.

Contractor was placing earthfill for dam using a sheepsfoot roller for compaction.

All work appeared to be satisfactory.

Very truly yours,

A. J. MACCHI, ENGINEERS

H. R. HOFFMAN, P. E.

A. J. MACCHI • ENGINEERS
DR. GILLIO PIZZETTI ASSOCIATE CONSULTANT

[illegible] GILLETT STREET HARTFORD, CONN. PHONE 525-6831
17 CORSO DUCA ABRUZZI TORINO, ITALY PHONE 519-473

N.S.P.E. A.S.C.E. A.C.I.

December 17, 1962

State of Connecticut
Water Resources Commission
165 Capitol Avenue
Hartford, Connecticut

Re: Dam on Goss Brook
Ashford, Connecticut

Gentlemen:

Please be advised that I visited the above project on Friday, December 14, 1962.

There was no activity on the jobsite presumably due to the cold weather. Water intake structure has been stripped and concrete is in good condition. By copy of this letter, the Boy Scouts of America, Eastern Connecticut Council, Inc. is requested to inform this office when work is resumed.

Very truly yours,

A. J. MACCHI, ENGINEERS

H. R. HOFFMAN, P. E.

cc. Boy Scouts of America
Eastern Conn. Council Inc.
126 Broadway
Norwich, Conn.

A. J. MACCHI • ENGINEERS
DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-8831
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

May 8, 1963

State of Connecticut
Water Resources Commission
165 Capitol Avenue
Hartford, Connecticut

Re: Dam on Goss Brook
Ashford, Connecticut

Gentlemen:

Please be advised that I visited the above project on Wednesday, May 8, 1963. Contractor was placing earthfill using two scrapers and three dozers.

All work appears to be satisfactory.

Very truly yours,

A. J. MACCHI, ENGINEERS

H. R. HOFFMAN, P. E.

A. J. MACCHI • ENGINEERS
DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET, HARTFORD, CONN. — PHONE 525-8831
17 CORSO DUCA ABRUZZI, TORINO, ITALY — PHONE 519-473

N.S.P.E. A.S.C.E. A.C.I.

June 6, 1963

Water Resources Commission
State of Connecticut
State Office Building
Hartford, Connecticut

Re: Goss Pond Dam
Ashford, Conn.

Gentlemen:

Please be advised that I visited the above project on Wednesday, June 5, 1963.

Earthwork appears to be about 95% complete. There was one bulldozer working dressing down side slopes at top of dam.

All work appears to be satisfactory.

Very truly yours,

A. J. MACCHI, ENGINEERS

H. R. HOFFMAN, P. E.

Eastern Connecticut Council, Inc.
BOY SCOUTS OF AMERICA
46 Franklin Street Norwich, Connecticut
Telephone TUrner 7-2276
COUNCIL NUMBER 76

June 29, 1963

State of Connecticut
Water Resources Commission
165 Capitol Avenue
Hartford, Connecticut

Gentlemen:

This is to advise that the dam on Goss Brook on our property in Ashford, Connecticut, has been completed.

Seeding of the dam and emergency spillway will be undertaken in August, and we are negotiating with Mr. Darwin Clark of Eastford, who has had considerable experience in this type of work, for the job.

Yours truly,

H.D. Barnes, Chairman
Camp Development Committee

cc. A.J. Macchi, Engineers

A. J. MACCHI • ENGINEERS
DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-6631
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

July 8, 1963

Water Resources Commission
State of Connecticut
165 Capitol Avenue
Hartford 15, Connecticut

Re: Goss Pond Dam

Gentlemen:

We are in receipt of a copy of a letter from the Eastern Connecticut Council Inc., Boy Scouts of America, to your office dated June 29, 1963 stating that construction on above project is completed except for seeding which is to be done during August.

During my visit to the site on Wednesday, July 3, 1963 I noticed some erosion caused by surface run off along the downstream face at the intersection of the toe of the dam and existing ground on the south side of the dam.

By copy of this letter the Soil Conservation Service is requested to investigate this situation as it appears that a bituminous concrete line drainage ditch may be required to avoid a maintenance problem. If there are any questions the writer would be glad to meet at the site with all interested parties at which time a final inspection can be scheduled.

Very truly yours,

A. J. MACCHI, ENGINEERS

H. R. HOFFMAN, P. E.

cc. Eastern Conn. Council
Boy Scouts of America
Norwich, Conn.

Soil Conservation Service
U.S. Dept of Agriculture
Old Bookstore Bldg.
Route 195
Storrs, Conn.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Old Bookstore Building
Storrs, Connecticut

July 9, 1963

STATE WATER RESOURCES COMMISSION
RECEIVED
JUL 10 1963
ANSWERED
REFERRED
FILED

A. J. Macchi, Engineers
44 Gillett Street
Hartford, Connecticut

Attention: Mr. H. R. Hoffman, P. E.

Gentlemen:

Regarding your observations on Goss Pond Dam of the erosion along the intersection of the embankment with the existing ground, I also made the same observation on July 5, 1963.

On all of our structures of comparative size and larger this gutter is always a critical location, however, the situation has been satisfactorily controlled with the establishment of vegetation. On the Goss Pond, Mr. Smith informed me, the vegetative work will be done in August.

With the elapse time, we would recommend that this area, and any others that could rill, should be regraded and a satisfactory seed bed be prepared previous to seeding. To protect the seeding we apply 1½ tons of mulch per acre and use as a binder 190 pounds of asphalt per acre. On one job three years ago we used a mulch netting on the gutter areas, but have obtained satisfactory results since with only mulch and the asphalt binder.

If you desire a Service representative at the time of final inspection I would suggest:

Mr. A. L. Weeks, Work Unit Conservationist
Soil Conservation Service
Agricultural Center
Brooklyn, Connecticut

If I can provide further information, please let me know.

Sincerely yours,

T. ... Wire
State Conservation Engineer

cc: Water Resources Commission
Eastern Conn. Council
Boy Scouts of America
Mr. A. L. Weeks

A. J. MACCHI • ENGINEERS

DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-6631
17 CORSO DUCA ABRUZZI — TORINO, ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

October 10, 1963

Water Resources Commission
State of Connecticut
165 Capitol Avenue
Hartford, Connecticut

Re: Goss Brook Dam
Ashford, Connecticut

Gentlemen:

A final inspection of construction for the above referenced dam was held on Wednesday, October 9, 1963. The following were present:

Mr. John Smith, Eastern Conn. Council Boy Scouts of America
Mr. E. Correll, Eastern Conn. Council Boy Scouts of America
H. R. Hoffman, A. J. Macchi, Engineers

The dam is substantially complete in accordance with contract plans and specifications and this office recommends that a certificate of approval be issued.

Very truly yours,

A. J. MACCHI, ENGINEERS

H. R. HOFFMAN, P. E.

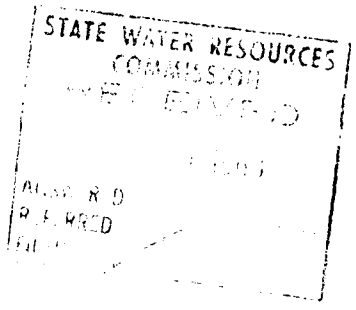
A. J. MACCHI • ENGINEERS

DR. GIULIO PIZZETTI — ASSOCIATE CONSULTANT

44 GILLETT STREET — HARTFORD, CONN. — PHONE 525-6631
17 CORSO DUCA ABRUZZI — TORINO ITALY — PHONE 519-473

N.S.P.E. — A.S.C.E. — A.C.I.

October 23, 1963



Water Resources Commission
State of Connecticut
165 Capitol Avenue
Hartford, Connecticut

Re: Dam at Goss Pond
Ashford, Conn.

Gentlemen:

Visited the above dam on W[illegible]. 23 1963. Mr. John Smith, representing [illegible] was present. Mr. Charles Pelletier of your [illegible] noticed a crack in the dam in the vicinity of the [illegible] water intake structure and requested that we look into this matter.

Mr. Smith was of the opinion that the earth fill was not adequately compacted in the [illegible] structure and as the water level was lowered this soil some subsidence took place. It was impossible to examine the area completely as the pond level has risen recently due to the fact that Ashford Lake which is upstream was drawn down about 4'. [illegible] pump on the concrete structure with a [illegible] and noted [illegible] settlement.

Mr. Smith's explanation [illegible] however I suggested that [illegible] on the [illegible] this office [illegible]

A. J. MACCHI, ENGINEERS

cc. Eastern Conn. Council
Boy Scouts of America

August 27, 1971

Macchi and Hoffman
Engineers
44 Gillett Street
Hartford, Connecticut

Re: Goss Brook Dam
(Boy Scouts Pond)
Ashford

Gentlemen:

Under the terms of your contract to act as a consultant to this Commission would you inspect the subject dam and send us a report on its condition with a recommendation of whether we should issue a Certificate of Approval on the structure.

Our files indicate that the last piece of correspondence was your letter of October 23, 1963. Would you try also to determine if Mr. Smith followed up on your recommendations.

Very truly yours,

William H. O'Brien, III
Civil Engineer

WHO:ljg

September 2, 1971

Eastern Connecticut Council Inc.
Boy Scouts of America
47 Town Street
Norwich, Connecticut

Re: Dam at Goss Pond
Ashford, Connecticut

Gentlemen:

This office has been requested by the Water Resources Commission, State of Connecticut to inspect the above dam in the near future. Enclosed is a copy of our letter of October 23, 1963 to the Water Resources Commission which reports the results of our last prior visit to this dam.

We would like to know if the control points referred to in the last paragraph of the above letter have been established and if periodic readings have been taken to ascertain if there has been any movement of the concrete water intake structure.

Please contact this office regarding the above and in order that the field inspection of this dam may be scheduled at a time convenient to a representative of your organization.

Very truly yours,

MACCHI & HOFFMAN, ENGINEERS

M. R. HOFFMAN, P.E.

Encl.
cc. Water Resources Commission

MACCHI & HOFFMAN • ENGINEERS

EXECUTIVE OFFICES • 44 GILLETT STREET • HARTFORD, CONN., 06105 • PHONE (203) 525-6631

A. J. MACCHI, P.E.
H. R. HOFFMAN, P.E.
MICHAEL GIRARD

ASSOCIATE CONSULTANT
PROF. C. W. DUNHAM

September 15, 1971

Water Resources Commission
State of Connecticut
165 Capitol Avenue
Hartford, Connecticut

Attention Mr. Wm. H. O'Brien III

Re: Goss Brook Dam
(Boy Scouts Pond)
Ashford, Conn.

Dear Mr. O'Brien:

In accordance with your letter of August 27, 1971, I inspected the above dam on Wednesday, September 15, 1971. Mr. Gardner Files, Camp Ranger, was present.

In reference to my recommendation as per our letter of October 23, 1963 to your office, with regard to the establishment of control points to check the concrete intake water structure for any movement, Mr. Files doesn't have any knowledge of this having been done and Mr. John Smith to whom the above recommendation was addressed has recently passed away.

The inspection of facilities on September 15, 1971 did not show any evidence of any subsidence of the embankment. This office is of the opinion that the crack noticed in 1963 was the result of non-uniform compaction and became apparent upon the initial filling of the pond.

This office therefore recommends that a certificate of approval be issued for this structure.

Very truly yours,

MACCHI & HOFFMAN, ENGINEERS

H. R. HOFFMAN, P.E.

STATE OF CONNECTICUT

WATER RESOURCES COMMISSION

STATE OFFICE BUILDING — HARTFORD, CONNECTICUT

CERTIFICATE OF APPROVAL

September 23, 1971

Eastern Connecticut Council
Boy Scouts of America
126 Broadway
Norwich, Connecticut

TOWN: **Ashford**
RIVER: **Mount Hope River**
TRIBUTARY: **Goss Brook**
CODE NO. **36H 9.7 GS 0.7**

Gentlemen:

NAME AND LOCATION OF STRUCTURE: **Goss Brook Dam (Boy Scout Pond Dam) located on Goss Brook, 0.6 miles due east from the junction of Route #89 and Perry Hill Road in the town of Ashford**

DESCRIPTION OF STRUCTURE AND WORK PERFORMED: **The work involved consisted of constructing an earth dam 38' in height and 650 feet in length immediately downstream of an existing concrete dam thereby raising the normal pond elevation from 470 to 490 feet above M.S.L. A grassed emergency spillway some 120' in width was constructed at the south end of the dam.**

CONSTRUCTION PERMIT ISSUED UNDER DATE OF: **July 17, 1962**

This certifies that the work and construction included in the plans submitted, for the structure described above, has been completed to the satisfaction of this Commission and that this structure is hereby approved in accordance with Section 25-114 of the 1958 Revision of the General Statutes.

The owner is required by law to record this Certificate in the land records of the town or towns in which the structure is located.

WATER RESOURCES COMMISSION

John J. Curry, Director

JJC:WHO:ljg

6-13-75

INFORMATION STORAGE AND RETRIEVAL - DAMS PLANNED AND CONSTRUCTED BY SCS

SITE ID NO.

IDENTIFICATION AND LOCATION

1. Eastern Conn. Boy Scout Pond
STRUCTURE DESIGNATION (NAME OR NUMBER)

2. Mount Hope - Shetucket
RIVER BASIN (NAME)

3. Goss Brook
WATERSHED (NAME OR UNNAMED)

4. Connecticut
STATE (NAME)

5. Windham
COUNTY (NAME)

6. Ashford
TOWNSHIP (NAME)

7. 2
CONGRESSIONAL DISTRICT (NUMBER)

8. ~~Eastern Highlands~~ NEW ENGLAND UPLAND
PHYSIOGRAPHIC AREA 1/ (NAME)

9. CO-01
AUTHORIZATION (WP, FP, RC&D, CO-OP, PILOT)

10. 41 52 46
LATITUDE (DEGREES, MINUTES, SECONDS)

11. 72 09 04
LONGITUDE (DEGREES, MINUTES, SECONDS)

12. 498.0
ELEVATION OF TOP OF DAM (SETTLED FILL-FEET MSL)

13. DATE PLAN APPROVED —

14. DATE OF MOST RECENT SUPPLEMENT
(LEAVE BLANK IF NOT SUPPLEMENTED)

15. DATE CONSTRUCTION COMPLETED 1963
(LEAVE BLANK IF NOT COMPLETED)

16. TYPE OF DAM (CIRCLE APPLICABLE) -
~~EARTH~~, ROCK, CONCRETE, OTHER

17. PLANNED PURPOSES (~~CIRCLE ALL APPLICABLE~~)
FLOOD PREVENTION, ~~RECREATION~~, ~~FISH & WILDLIFE~~, MUNICIPAL AND INDUSTRIAL WATER SUPPLY, IRRIGATION, NAVIGATION, HYDRO-ELECTRIC, SEDIMENT CONTROL, LOW FLOW AUGMENTATION, OTHER

18. HAZARD CLASS (A, B, OR C) B

19. EARTHQUAKE ZONE 2/ (0, 1, 2, 3, or 4) 1

SIZE AND CAPACITY

20. DRAINAGE AREA UNCONTROLLED 1158 AC.
(UPSTREAM FROM STRUCTURE)

21. DRAINAGE AREA CONTROLLED — AC.
(UPSTREAM FROM STRUCTURE)

22. MAXIMUM FILL HEIGHT 38 FT.
(FROM LOW POINT ON CENTERLINE, BEFORE EXCAVATING, TO TOP OF SETTLED FILL.)

23. CREST LENGTH OF DAM (ALONG CENTERLINE) 650 FT.

24. VOLUME OF FILL 47,000 CU. YD.

25. SUBMERGED SEDIMENT STORAGE — AC. FT.

26. AERATED SEDIMENT STORAGE — AC. FT.

27. MUNICIPAL AND INDUSTRIAL WATER STORAGE — AC. FT.

28. RECREATION WATER STORAGE — AC. FT.

29. FISH AND WILDLIFE STORAGE 341 AC. FT.

30. IRRIGATION STORAGE — AC. FT.

31. OTHER BENEFICIAL STORAGE — AC. FT.

32. TOTAL FLOOD STORAGE ~~—~~ 78 AC. FT.

33. TEMPORARY EMERGENCY SPILLWAY STORAGE (BETWEEN CREST OF LOWEST EMERGENCY SPILLWAY AND TOP OF SETTLED FILL)
176 AC. FT.

34. SURFACE AREA OF NORMAL POOL 24 AC.

35. LENGTH OF SHORE LINE OF NORMAL POOL 0.9 MILES

36. MAXIMUM DEPTH OF NORMAL POOL 19.5 FT.

PRINCIPAL SPILLWAY FEATURES

37. PRINCIPAL SPILLWAY TYPE (CIRCLE APPLICABLE) -
PIPE, MONOLITHIC, OPEN CONCRETE STRUCTURE, OTHER

38. IS THERE COLD WATER RELEASE FACILITY? NO

39. NUMBER OF STAGES 1 (1 or 2)

40. LOW STAGE CAPACITY -0- CFS
(AT HIGH STAGE PRINCIPAL SPILLWAY CREST)

41. PRINCIPAL SPILLWAY CAPACITY 292 CFS
(AT LOWEST EMERGENCY SPILLWAY CREST)

PRINCIPAL SPILLWAY CONDUIT FEATURES

42. MAJOR PORTION OF CONDUIT IS ON (CIRCLE APPLICABLE) -
ROCK OR EARTH

43. TYPE OF ENERGY DISSIPATOR (CIRCLE APPLICABLE) -
IMPACT BASIN, SAF, PLUNGE POOL, NONE, OTHER

44. CONDUIT SIZE 3.5
(LARGEST CONDUIT THROUGH DAM) (DIAM. IN FT. IF ROUND) (HEIGHT AND WIDTH IN FT. IF MONOLITHIC) ALSO SHOW NUMBER OF BARRELS IF MULTI-BARREL

45. ~~INLET TYPE~~ (CIRCLE APPLICABLE) - CONCRETE-OPEN TOP, COVERED TOP, HOOD INLET, METAL-OPEN TOP, OTHER

46. HEIGHT OF RISER 23.2 FT.
(FROM TOP OF FLOOR TO TOP OF ANTI-VORTEX)

EMERGENCY SPILLWAY FEATURES

47. PRIMARY EMERGENCY SPILLWAY TYPE (CIRCLE APPLICABLE)
~~CLOSED CONDUIT~~, OPEN CONCRETE STRUCTURE, EARTH, VEGETATED, SOFT ROCK, HARD ROCK 3/

48. PRIMARY EMERGENCY SPILLWAY WIDTH 120 FT.
(CREST LENGTH FOR CONCRETE)

49. 1.4 %
PERCENT CHANCE OF USE OF PRIMARY EMERGENCY SPILLWAY

1/ N. M. Fenneman, 1938, Physiography of Eastern United States, McGraw Hill Book Co., New York, N. Y.

2/ See TSC Technical Note - Engineering UO-22.

3/ Soft Rock - Rock that will erode when subjected to flowing water.
Hard Rock - Rock that is resistant to erosion due to flowing water.

CONTINUED ON REVERSE SIDE

EMERGENCY SPILLWAY FEATURES (CONT'D.)

50. 7000 CFS
CAPACITY OF PRIMARY EMERGENCY SPILLWAY (WHEN POOL IS AT TOP OF DAM)

51. 4.7 FT.
DIFFERENCE IN ELEVATION BETWEEN CREST OF PRIMARY EMERGENCY SPILLWAY AND TOP OF DAM

52. SECONDARY EMERGENCY SPILLWAY IS (CIRCLE APPLICABLE)
NONE, EARTH, VEGETATED, SOFT ROCK, HARD ROCK 3/

53. WIDTH OF SECONDARY EMERGENCY SPILLWAY _____ FT.

54. CAPACITY OF SECONDARY EMERGENCY SPILLWAY (WHEN POOL IS AT TOP OF DAM) _____ CFS

55. _____ FT.
DIFFERENCE IN ELEVATION BETWEEN CREST OF SECONDARY EMERGENCY SPILLWAY AND TOP OF DAM

OMIT ITEMS 56-59 IF DRAINAGE AREA IS LESS THAN 10 SQUARE MILES

56. BULK LENGTH OF SOFT ROCK 3/ EARTH OR VEGETATED SPILLWAY (SEE TR-52 FOR DEFINITION) _____ FT.

57. _____
PI OF SURFACE MATERIAL IN EARTH OR VEGETATED SPILLWAY (PREDOMINANT MATERIAL AT OR NEAR SURFACE BEFORE TOP SOILING)

58. _____
USCS CLASSIFICATION OF ABOVE MATERIAL

59. _____ AC. FT.
VOLUME OF OUTFLOW THROUGH VEGETATED OR EARTH SPILLWAY (DURING PASSAGE OF FREEBOARD HYDROGRAPH)

COST DATA * Not Applicable

WORK PLAN

60. LAND RIGHTS COST $ _____

61. FEDERAL SHARE OF LAND RIGHTS COST $ _____

62. CONSTRUCTION COST $ _____
(DOES NOT INCLUDE LAND RIGHTS, ENGINEERING AND PROJECT ADMINISTRATION)

63. FEDERAL SHARE OF CONSTRUCTION COST IN PERCENT _____ %

COMPLETED STRUCTURE

64. FINAL CONSTRUCTION COST $ _____

MISCELLANEOUS DATA

65. Boy Scout Pond
POPULAR NAME OF DAM

66. _____
NAME OF RESERVOIR

67. NEAREST CITY OR TOWN Warrenville

68. TYPE OF DAM IF CONCRETE (CIRCLE APPLICABLE)
BUTTRESS, ARCH, MULTI-ARCH

69. IS DISCHARGE THROUGH PRINCIPAL SPILLWAY CONTROLLED BY GATES? NO

70. ESTIMATED COMPLETION DATE (IF UNDER CONSTRUCTION) _____

71. OWNER Eastern Conn. Council of Boy Scouts

72. ENGINEERING BY SCS

73. CONSTRUCTION BY Becker Const. Co.
(CONSTRUCTION CONTRACTOR)

74. ABOVE DATA FURNISHED BY J. Polulech
(NAME)

75. DATE DATA FURNISHED 12/22/75

76. REMARKS * Cost Data not applicable. CO-01 funding.

Soft Rock - Rock that will erode when subjected to flowing water.

Hard Rock - Rock that is resistant to erosion due to flowing water.

INFORMATION DATA RETRIEVAL SYSTEM ON CAMS

HYD UNIT NUMBER

*******TABLE OF CONTENTS*******

12/14/79 SITE ID CT-31 01100002

(1) EAST CT BOY SCOUT PD	(2) MOUNT HOPE-SHETUCKET	(3) GOSS BROOK
(4) CONNECTICUT	(5) WINDHAM	(6) ASHFORD
(7) Z	(8) NEW ENGLAND UPLAND	(9) CO-01
(10) 41-52-46	(11) 072-09-04	(12) 498.0
(13)	(14)	(15) / /63
(16) EARTH	(17) RECREATION	(17) FISH & WILDLIFE
(17)	(17)	(17)
(18) B	(19) 1	(20) 1,158
(21)	(22) 38.0	(23) 650
(24) 47,000	(25) .0	(26) .0
(27)	(28) 170	(29) 171
(30)	(31)	(32) 78
(33) 176	(34) 24.0	(35) .9
(36) 19	(37) PIPE	(38) NO
(39) 1	(40) .00	(41) 292
(42) EARTH	(43) NONE	(44) 3.5
(44) .0	(44) 1	(45) CONCRETE-COVERED TOP
(46) 23.2	(47) VEGETATED	(48) 120
(49) 1	(50) 7,000	(51) 4.7
(52) NONE	(53)	(54)
(55) .0	(56)	(57)
(58)	(59)	(60)
(61)	(62)	(63)
(64)	(65) BOY SCOUT POND	(66)
(67) WARRENVILLE	(68)	(69) NO
(70)	(71) EASTERN CT. COUNCIL OF BOY SCT	(72) S.C.S.
(73) BECKER CONSTRUCTION CO.	(74) J. POLOLECH	(75) 12/22/75
(76) COST DATA NOT APPLICABLE. CO-01 FUNDING		

STORAGE BETWEEN THE EMERGENCY SPILLWAY CREST & TOP OF DAM

CONNECTICUT

SITE ID	WATERSHED NAME	AUTHORIZATION	DATE CONSTRUCTION COMPLETED	HAZARD CLASS	MAX. FILL HEIGHT FEET	STORAGE TO EM SPWY CREST	EMER. SPWY. STORAGE AC.FT.
CT-2	FURNACE BROOK-MIDDLE RIVER	WP	/ /60	C	39.0	566.8	215
CT-3	FURNACE BROOK-MIDDLE RIVER	WP	/ /60	C	36.0	461.8	192
CT-6	FURNACE BROOK-MIDDLE RIVER	WP	/ /60	C	26.0	344.0	197
CT-7	BLACKBERRY RIVER	WP	/ /60	C	29.0	2,651.0	1,440
CT-4	FURNACE BROOK-MIDDLE RIVER	WP	/ /61	C	27.0	393.0	715
CT-1	FURNACE BROOK-MIDDLE RIVER	WP	/ /62	C	50.0	1,371.6	600
CT-15	NORTH BRANCH-PARK RIVER	WP	/ /62	C	22.0	1,802.0	1,378
CT-13	NORTH BRANCH-PARK RIVER	WP	/ /63	C	22.0	847.3	915
CT-31	GOSS BROOK	CO-01	/ /63	B	38.0	419.0	176
CT-36	UNNAMED	CO-01	/ /63	A	27.0	22.0	9
CT-14	NORTH BRANCH-PARK RIVER	WP	/ /64	C	21.0	693.1	1,490
CT-17	SOUTH BRANCH-PARK RIVER	WP	/ /64	C	27.0	822.6	379
CT-19	SOUTH BRANCH-PARK RIVER	WP	/ /64	C	31.0	655.4	250
CT-12	SPAULDING POND BROOK	WP	/ /65	C	28.0	210.0	45
CT-20	SOUTH BRANCH-PARK RIVER	WP	/ /66	C	36.0	280.6	
CT-9	BLACKBERRY RIVER	WP	/ /66	C	40.0	513.9	226
CT-11	BLACKBERRY RIVER	WP	/ /68	C	77.0	3,629.6	926
CT-16	NORTH BRANCH-PARK RIVER	WP	/ /68	C	18.0	1,099.2	679
CT-5	FURNACE BROOK-MIDDLE RIVER	WP	/ /68	C	27.0	4,038.5	1,100
CT-33	SPAULDING POND BROOK	WP	08/ /68	C	16.0	30.9	24
CT-18	SOUTH BRANCH-PARK RIVER	WP	/ /69	C	14.0	726.0	425
CT-10	BLACKBERRY RIVER	WP	/ /71	C	35.0	1,069.0	333
CT-35	SAWMILL BROOK/BLACKLEDGE RIVER	CO-01	/ /71	A	19.0	163.0	97
CT-8	BLACKBERRY RIVER	WP	/ /71	C	20.0	892.3	866
CT-24	NORWALK RIVER	WP	/ /73	C	21.0	513.0	630
CT-32	FARM BROOK	WP	/ /74	B	12.0	118.4	65
CT-34	SCHOOLHOUSE BROOK	RCED	08/ /74	A	25.0	50.2	45
CT-26	FARM BROOK	WP	08/16/77	C	28.0	~~1,018.2~~ 720	~~[illegible]~~ 470

~~CT-21 NAUGATUCK 2 BEING UPRATED 10/79~~

DAM - NOTE CHANGE TIME

APPENDIX C

DETAIL PHOTOGRAPHS

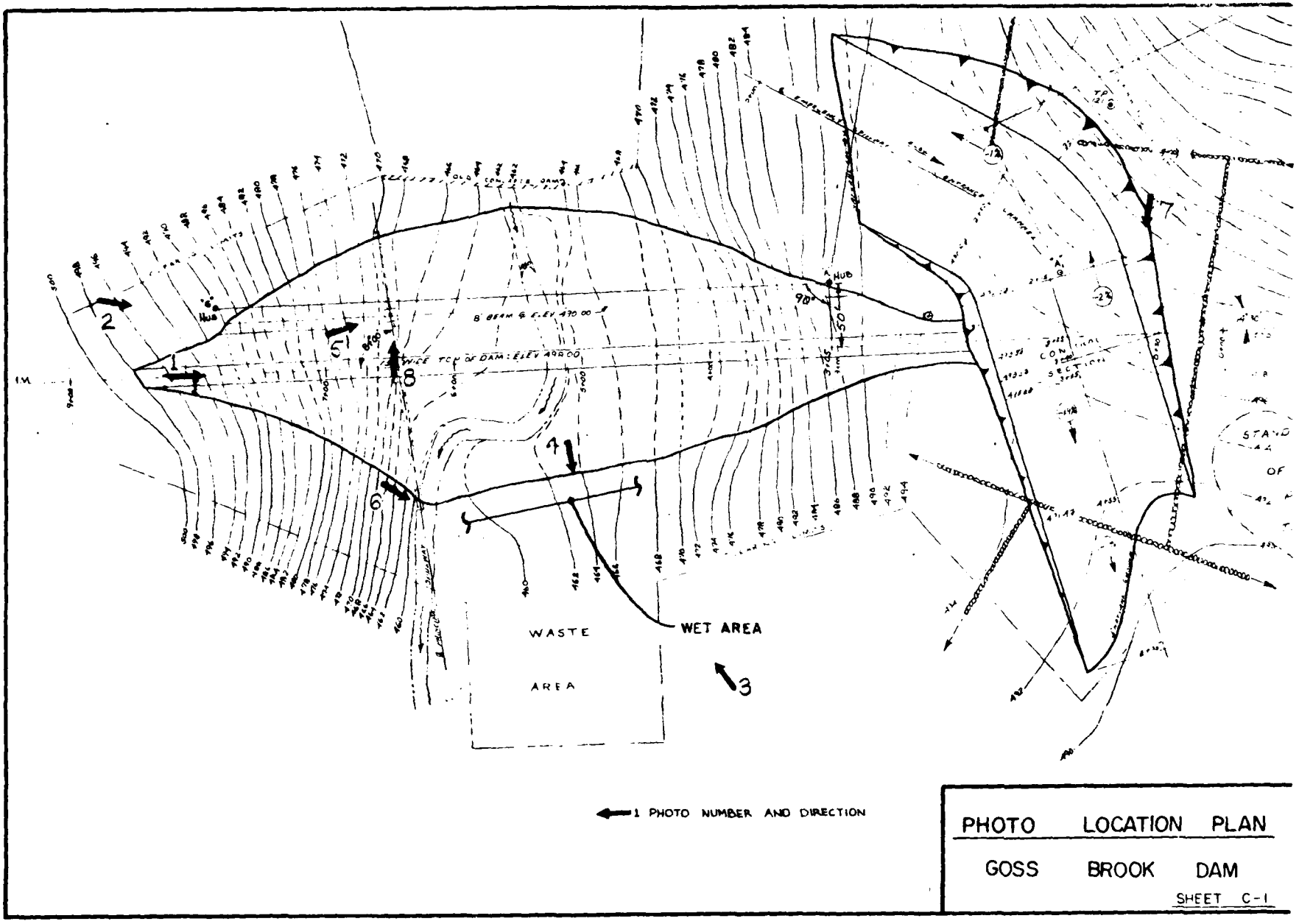


PHOTO LOCATION PLAN

GOSS BROOK DAM

SHEET C-1

Photo 1 - Top of dam. Note slightly matted grass due to vehicular traffic and sparse area in foreground (8/21/80).

Photo 2 - Upstream slope of dam (8/21/80)

US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS CAHN ENGINEERS INC WALLINGFORD, CONN ENGINEER	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	Goss Brook Dam Goss Brook Ashford, CT CE # 27 785 KC DATE Sept'80 PAGE C-1

Photo 3 - Downstream slope of dam. Note scattered small brush on slope (8/21/80).

Photo 4 - Typical view of wet condition at toe of downstream slope (8/21/80).

US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. AHN ENGINEERS, INC WALLINGFORD, CONN ENGINEER	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	Goss Brook Dam Goss Brook Ashford, CT CE # 27 735 CT DATE Sept. '80 PAGE

Photo 5 - Principal spillway intake structure (8/21/80).

Photo 6-42" reinforced concrete spillway discharge pipe (8/21/80).

US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS. CAHN ENGINEERS, INC. WAKEFIELD, MASS. ENGINEER	NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	Goss Brook Dam Goss Brook Ashford, CT CE # 27 785 EI DATE Sept. 1980 FAST

Photo 7 - View of emergency spillway, looking downstream (8/21/80).

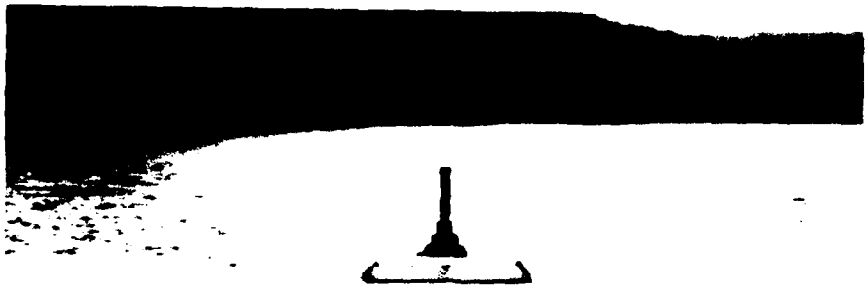


Photo 8 - Zoom - lens view of low-level outlet gate valve stem (8/21/80).

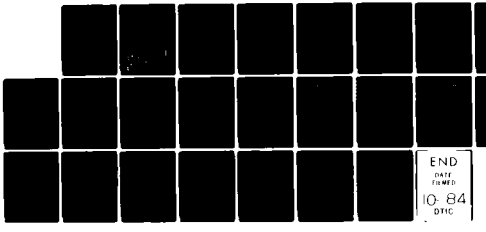
APPENDIX D

HYDRAULICS/HYDROLOGIC COMPUTATIONS

AD-A144 723 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
GOSS BROOK DAM (CT 00..(U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV SEP 80

2/2

UNCLASSIFIED F/G 13/13 NL



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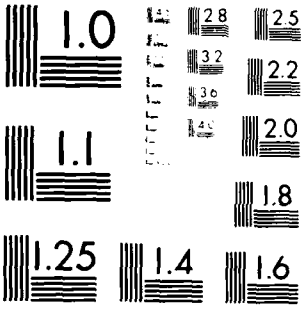
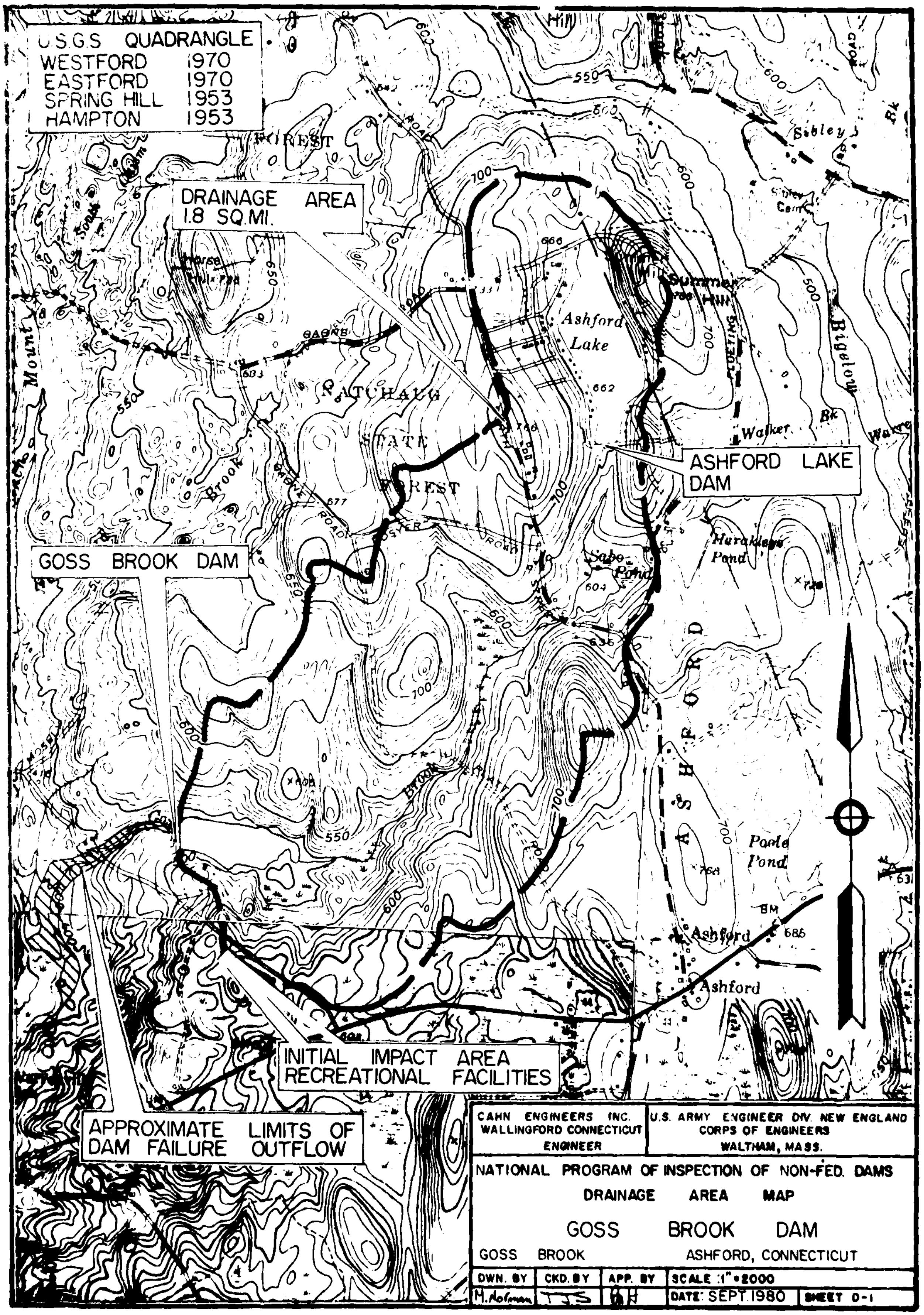



U.S.G.S QUADRANGLE
WESTFORD 1970
EASTFORD 1970
SPRING HILL 1953
HAMPTON 1953
DRAINAGE AREA
1.8 SQ.MI.
ASHFORD LAKE
DAM
GOSS BROOK DAM
INITIAL IMPACT AREA
RECREATIONAL FACILITIES
APPROXIMATE LIMITS OF
DAM FAILURE OUTFLOW
Ashford Lake
Summer Hill
Sabo Pond
Horakley Pond
Poole Pond
Ashford
Walker Bk
Bigelow
Sibley
NATCHAUG STATE FOREST
CAHN ENGINEERS INC.
WALLINGFORD CONNECTICUT
ENGINEER
U.S. ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
DRAINAGE AREA MAP
GOSS BROOK DAM
GOSS BROOK
ASHFORD, CONNECTICUT
DWN. BY
CKD. BY
APP. BY
SCALE 1" = 2000
M. Hoffman
TJS
DATE SEPT 1980
SHEET D-1

HYDRAULIC/HYDROLOGIC INSPECTION

GOSS BROOK DAM, ASHFORD, CT.

I). PERFORMANCE AT PEAK FLOOD CONDITIONS:

1) PROBABLE MAXIMUM FLOOD (PMF)

a) WATERSHED CLASSIFIED AS "ROLLING"

b) WATERSHED AREA:

THE DAM IS LOCATED D/S FROM ASHFORD LAKE. THE TOTAL WATERSHED IS SUBDIVIDED AS FOLLOWS:

i) D.A. TO ASHFORD LAKE DAM: $(DA)_{AL} = 0.36$ sq mi
ii) INCREMENT TO GOSS BROOK DAM: $\Delta(DA)_{GB} = 1.44$ sq mi
iii) TOTAL D.A. TO GOSS BROOK DAM: $(DA)_{GB} = 1.80$ sq mi

NOTE: DA's FROM CONN. DEP BULLETIN No 1, 1972 (GAZETTEER OF NATURAL DRAINAGE AREAS) p. 8. - S.C.S. CONSTRUCTION DWGS./DESIGN DATA OF GOSS BROOK DAM (BOY SCOUT CAMP RECREATION POND) GIVE DA = 1158 AC ≅ 1.81 sq mi

c) PEAK FLOODS (FROM NED-ACE GUIDELINES - GUIDE CURVES FOR PMF):

i) FROM GUIDE CURVES BY EXTRAPOLATION TO D.A. < 2 sq mi

$CSM \cong 2200$ CFS/sq mi (TOTAL D.A.)

THE PEAK FLOOD REDUCTION AT GOSS BROOK DAM FROM ASHFORD LAKE (A ≅ 55 AC), REGULATING (±) 20% OF THE TOTAL D.A., IS RELATIVELY SMALL AND THEREFORE, IT WILL BE TAKEN INTO CONSIDERATION BY REDUCING THE CSM TO:

$(CSM)_{ADJ.} = \underline{2000}$ CFS/sq mi

(ii) PMF = 2000 × 1.8 = 3600 cfs

(iii) ½ PMF = 1800 cfs

2) SURCHARGE AT PEAK INFLOWS (PMF AND ½ PMF)

a) OUTFLOW RATING CURVE

i) SPILLWAYS AND OVERFLOW PROFILE OF DAM

SIOSS BROOK DAM HAS TWO SPILLWAYS. THE PRINCIPAL SPILLWAY (CONDUIT) WITH WEIR CREST (LONG SIDES OF A 10.5' × 3.5' RISER) AT ELEV. 490' NGVD** AND TOP SLAB COVER WITH SOFFIT AT ELEV. 492.5' NGVD. TOTAL LENGTH OF SPILLWAY L=21'. THE RISER (±) 20' HIGH DISCHARGES AT THE BOTTOM (ELEV. 470' NGVD) THRU A 42"ϕ PIPE, (±) 160' LONG. OUTLET INVERT ELEV. (±) 459' NGVD. THE EMERGENCY SPILLWAY, AN EARTH CHANNEL TO THE LEFT OF THE EMBANKMENT WITH CONTROL SECTION AT (±) ELEV. 493.3' NGVD. THE CONTROL SECTION (EARTH, GRASSED) OF THIS SPILLWAY IS TRAPEZOIDAL (±) L=120' AND (±) 30' WIDE WITH SIDE SLOPES (±) 4" TO 1' (FIELD MEASURE*) (3" TO 1' - DESIGN/DWGS). NORMAL POOL ELEV. 490' NGVD.

THE TOP OF THE DAM AND/OR ADJACENT TERRAIN IS (±) HORIZONTAL (ELEV. 498' NGVD) FOR APPROX. 630' AND THEN, RISES AT (±) 18" TO 1' SLOPE. TO THE LEFT OF THE EMERGENCY SPILLWAY, THE TERRAIN RISES FROM (±) ELEV. 498' NGVD AT (±) 9.6' TO 1' SLOPE. THE OVERFLOW SECTION IS GRASSED.

*NOTE: DIMENSIONS/ELEVS. FROM S.C.S. DWGS NO. CN-W-SOP, SHEETS 1 TO 8, "BOY SCOUT RECREATION POND) DATED FEB. 1962 AND/OR C.E. FIELD MEASURE ON 7/31/80 BY MM-MB

** NATIONAL GEODETIC VERTICAL DATUM (NGVD) ELEVATIONS EQUIVALENT TO THE MSL ELEVS. ON S.C.S. CONSTRUCTION DRAWINGS (CN-W-SOP).

THEREFORE, ASSUME C=3.2 FOR BOTH, THE PRINCIPAL SPILLWAY (FREE DISCH.) AND EMERGENCY SPILLWAY FLOW AND C=3.0 FOR THE DAM AND ADJACENT TERRAIN OVERFLOWS.

THE PRINCIPAL SPILLWAY CONDUIT (RISER/PIPE) FLOWS FULL AT APPROXIMATELY THE SAME HEAD AT WHICH THE SPILLWAY STARTS WORKING AS AN ORIFICE. THE SUBMERGED WEIR FLOW RANGE IS THEREFORE NEGLIGEABLE. ASSUMING AN ORIFICE (SPWY) DISCHARGE COEFFICIENT $C_o \cong 0.7$; $n \cong 0.015$ FOR THE CONDUIT AND TOTAL ENTRANCE/OUTLET LOSSES OF $1.0 h_v$ AND $1.5 h_v$ FOR THE RISER AND PIPE CONDUIT SECTIONS, RESPECTIVELY, THE PRINCIPAL SPILLWAY FLOW FLOWING FULL ($\pm$) $H \geq 2.5'$ ABOVE THE SPWY CREST) CAN BE APPROXIMATED BY THE EQUATION:

$$Q_{PS} = 45.4 (H + 29.3)^{1/2} \quad (\text{℄ OF COND. OUTL. ELEV.} \cong 460.7 \text{ NGVD})$$

(NOTE: FOR $H = 3.3'$; $Q_{PS} = 254^{CFS}$ (±) 11% LOWER THAN $Q = 292^{CFS}$ GIVEN ON "INFORMATION STORAGE AND RETRIEVAL - DAMS PLANNED AND CONSTRUCTED BY SCS" DATA SHEET FOR SITE ID. NO. CT-31)

ii) THE OVERFLOW RATING CURVE FOR THE RANGE OF FLOWS/SURCHARGES CONSIDERED CAN BE APPROXIMATED AS FOLLOWS:

1) TERRAIN TO THE LEFT OF THE EMERG. SPWY.*

$$Q_1 = 0.4 \times 9.6 \times 3 (H-8)^{3/2} = 11.5 (H-8)^{3/2}$$

* NOTE: FLOW OVER SLOPED SECTIONS, BY APPLICATION OF FORMULA GIVEN BY THE USGS IN "MEASUREMENT OF PEAK DISCHARGES AT DAMS BY INDIRECT METHODS" BY H. HULSING (APPLICATIONS OF HYDR.)

$$Q = \frac{2Cb}{5(h_b - h_a)} \left[h_b^{5/2} - h_a^{5/2} \right]$$ WHERE Q = DISCH.; C = DISCH. COEFF.; b = LENGTH; h_a & h_b = STATIC HEAD REFERRED TO HIGH & LOW ENDS OF WEIR, RESPECTIVELY.

2') EMERGENCY SPILLWAY:

SLOPING SECTIONS (4H:1V):

$$(Q_2)_1 = 0.4 \times 8 \times 3.2 (H-3.3)^{5/2} = \underline{10.2 (H-3.3)^{5/2}} \quad ; \quad H \leq 8'$$

$$(Q_2)_2 = \underline{10.2 \left[(H-3.3)^{5/2} - (H-8)^{5/2}\right]} \quad ; \quad H > 8'$$

HORIZONTAL SECTION:

$$(Q_2)_3 = 3.2 \times 120 (H-3.3)^{3/2} = \underline{384 (H-3.3)^{3/2}}$$

3') TOP OF DAM AND ADJACENT HORIZ. TERRAIN:

$$Q_3 = 3 \times 630 (H-8)^{3/2} = \underline{1890 (H-8)^{3/2}}$$

4') SLOPING TERRAIN TO THE RIGHT OF THE DAM:

$$Q_4 = 0.4 \times 18 \times 3 (H-8)^{5/2} = \underline{21.6 (H-8)^{5/2}}$$

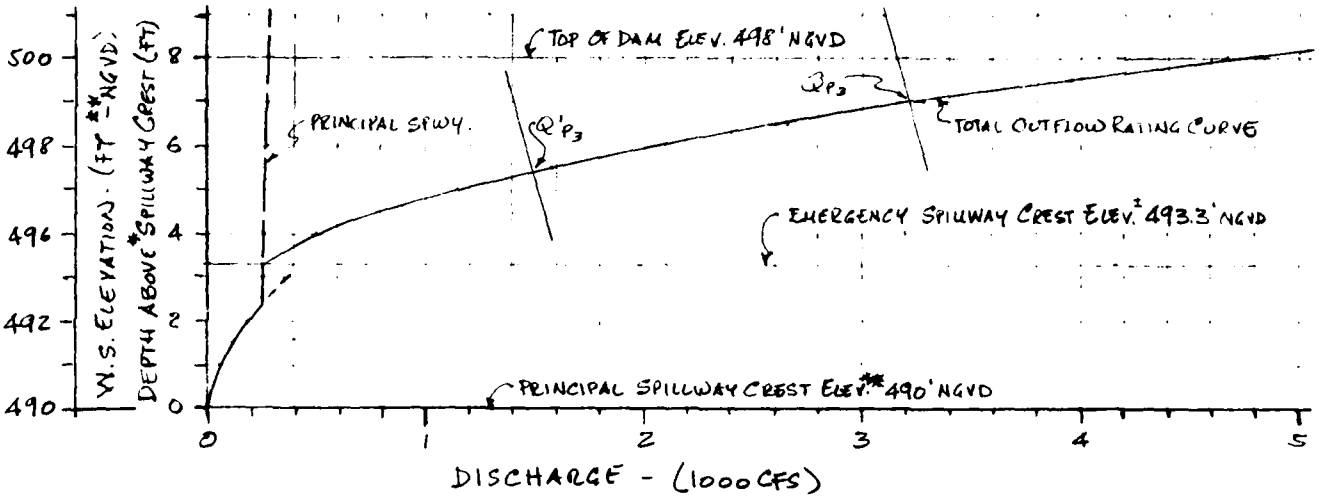
THE TOTAL OUTFLOW IS APPROXIMATED BY THE SUM OF THE APPLICABLE FORMULAE ON ITEMS (1') TO (4') AND THE FLOW THRU THE PRINCIPAL SPILLWAY (p. D-3). THE CORRESPONDING OVERFLOW RATING CURVE IS PLOTTED ON P. D-5.

b) SURCHARGE HEIGHTS TO PASS PEAK INFLOWS ($Q_{P_1} = Q'_{P_1}$)

i) @ $Q_{P_1} = PMF = 3600^{cfs}$ $H_1 = \underline{7.3'}$

ii) @ $Q'_{P_1} = \frac{1}{2} PMF = 1800^{cfs}$ $H_1 = \underline{5.7'}$

GOSS BROOK DAM - OUTFLOW RATING CURVE



* NORMAL POOL AT PRINCIPAL SPILLWAY CREST ELEV 490' NGVD.
** SEE NOTE ON P. D-2

c) EFFECT OF SURCHARGE STORAGE - PEAK OUTFLOWS

i) AVERAGE LAKE AREA ($\bar{A}$) WITHIN EXPECTED SURCHARGE:

1') LAKE AREA AT NORMAL POOL* (ELEV. 490 'NGVD) $A_{NL} = 23.9$ AC
2') AREA AT ELEV. 500' NGVD (MSL)* $A_{500} = 40.2$ AC

∴ AVE. LAKE AREA WITHIN MAX. EXPECTED SURCHARGE (±) 7.3': $\bar{A} \approx \underline{30}$ AC

* AREAS FROM U.S.C.E. CONSTRUCTION DWGS. N° CN-W-50P, SHEET 2 OF 8. (SEE CURVE P. D-7)

ii) WATERSHED D.A. = 1.80 sq mi

iii) PEAK OUTFLOWS (Q_{P_3} & Q'_{P_3})

(DETERMINED ON THE OUTFLOW RATING CURVE (SEE ABOVE), BY USING THE APPROX. ROUTING NED-ACE GUIDELINES "SURCHARGE STORAGE ROUTING" ALTERNATE METHOD AND 19" MAX. PROBABLE P.D. IN NEW ENGLAND).

$Q_{P_3} \approx 3200^{cfs}$ $H_3 \approx 7.0'$ (ELEV. 497.0' NGVD)

$Q'_{P_3} \approx 1500^{cfs}$ $H'_3 \approx 5.4'$ (ELEV. 495.4' NGVD)

5) SPILLWAY CAPACITY RATIO TO PEAK OUTFLOWS:

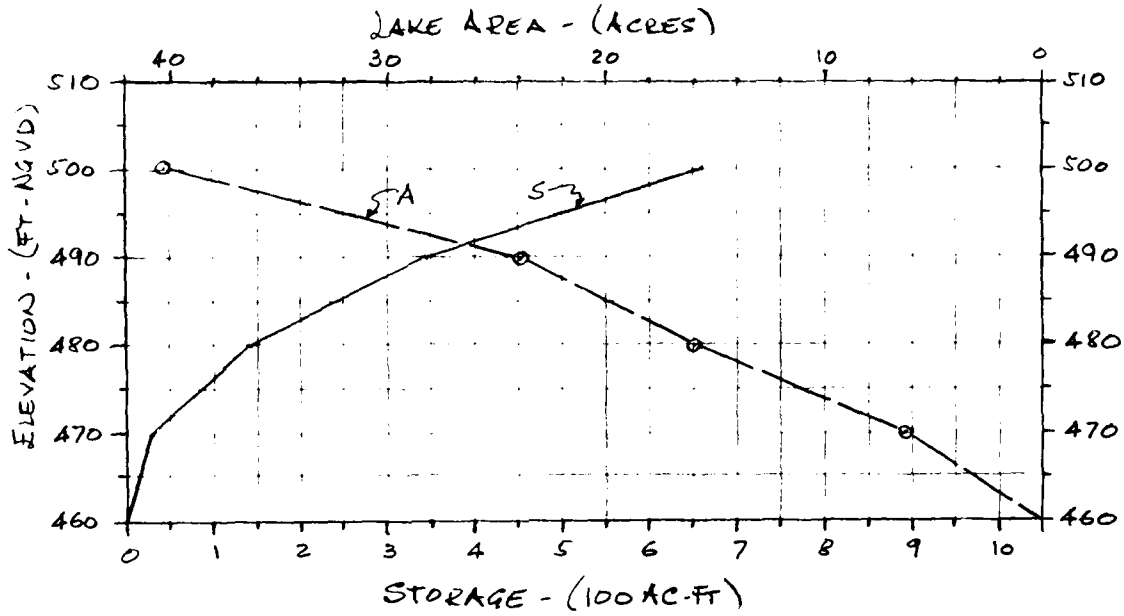
SPILLWAY CAPACITY TO:	SURCH* H (FT)	W.S. ELEV. (FT-NGVD)	SPILLWAY CAPACITY (CFS)**	SPILLWAY CAPACITY AS % OF PEAK OUTFLOWS	
				Q_{P_3} (3200^{cfs})	Q'_{P_3} (1500^{cfs})
EM. SPWY. CREST	3.3	493.3	260	8.1	17
½ PMF	5.4	495.4	1500	—	100
PMF	7.0	497.0	3200	100	—
TOP OF DAM	8.0	498.0	⊛4700	150	310

*SURCHARGE ABOVE NORMAL POOL (PRINCIPAL SPILLWAY CREST ELEV 490' NGVD)

**COMBINED CAPACITY OF PRINCIPAL AND EMERGENCY SPILLWAYS.

⊛ EMERGENCY SPILLWAY CAPACITY GIVEN ON "INFORMATION STORAGE AND RETRIEVAL - DAMS PLANNED AND CONSTRUCTED BY S.C.S." DATA SHEET FOR SITE ID NO CT-31 (ITEM 50) IS $Q_{ES} = 7000^{CFS}$ OR, (±) 47% LARGER CAPACITY THAN THE ABOVE ESTIMATE.

4) LAKE AREA/STORAGE CURVES - SOSS BROOK DAM



⊙ AREAS FROM SCS CONSTRUCTION DWGS N°CN-W-SOP, SHEET 2 OF 8
NOTE - SEEPP D-5 (AREAS) AND D-9 (STORAGE)

GOSS BROOK DAM

II) DOWNSTREAM FAILURE HAZARD

1) POTENTIAL IMPACT AREA

a) GOSS BROOK DAM IS ONE OF THE MAIN RECREATIONAL FACILITIES OF A BOY SCOUT CAMP NEAR WARRENVILLE, CT. SERVING (±) 250 SCOUT CAMPERS WEEKLY, DURING THE SUMMER AND ON SPECIAL OCCATIONS THROUGHOUT THE YEAR, TO A STILL LARGER SCOUT POPULATION. CAMP SITES, A RIFLE RANGE AND A CUB SCOUT DAY CAMP ARE LOCATED WITHIN THE SCOUT CAMP RELATIVELY LOW ABOVE THE GOSS BROOK BED AT A SHORT DISTANCE D/S FROM THE DAM. GOSS BROOK DISCHARGES INTO THE MOUNT HOPE RIVER, WHICH CROSSES WARRENVILLE (±) 1.5 MI D/S FROM THE DAM. TWO HOUSES WITH FIRST FLOOR ELEVATIONS ± (±) 5.3' AND 8.4', AND SEVERAL OTHER WITH F.F. ELEVS. RANGING FROM (±) 11' TO 12' ABOVE THE STREAM, ARE LOCATED IN WARRENVILLE. THIS BROOK/RIVER REACH (±) 9000' LONG, IS THE POTENTIAL IMPACT AREA IN CASE OF FAILURE OF GOSS BROOK DAM.

2) FAILURE AT GOSS BROOK DAM.

ASSUME SURCHARGE TO TEST FLOOD ELEVATION (PMF - SEE p. D-12)
(ELEV. 497.0' NGVD)

a) HEIGHT OF DAM*: $H_n = 40.5'$ (STREAMBED ELEV. (±) 457.5' NGVD)

b) MID-HEIGHT LENGTH*: $C \cong 347'$

c) BREACH WIDTH (SEE NED-ACE D/S DAM FAILURE GUIDELINES)

$W = 0.4 \times 347 \cong 139'$: ASSUME $W_b = 139'$

*FROM CE FIELD MEASUREMENTS ON 7/31/80 BY HH & AB

d) ASSUMED WATER DEPTH AT TIME OF FAILURE: $Y_o = \underline{39.5'}$

e) SPILLWAY DISCHARGE AT TIME OF FAILURE: $Q_s = 3200^{CFS}$ (SEE p. D-6)

f) BREACH OUTFLOW (SEE NED-ACE GUIDELINES)

$$Q_b = \frac{8}{27} W_b \sqrt{g}\, Y_o^{3/2} \approx 58000^{CFS}$$

g) PEAK FAILURE OUTFLOW (Q_p) TO GUSS BROOK.

$$Q_{p_1} = Q_s + Q_b = 61200^{CFS} \quad \text{SAY,} \quad Q_{p_1} \approx \underline{61000}^{CFS}$$

3) FLOOD DEPTH * IMMEDIATELY D/S FROM DAM:

$$Y = 0.40 Y_o \approx \underline{\underline{17.4'}}$$

*(FROM RETARDING WAVE THEORY APPLIED TO DAM FAILURE)

4) ESTIMATE OF D/S FAILURE CONDITIONS AT POTENTIAL IMPACT AREA:

(SEE NED-ACE GUIDELINES FOR ESTIMATING D/S FAILURE HYDROGRAPHS)

a) THE CHANNEL D/S FROM GUSS BROOK DAM IS DIVIDED IN 2 REACHES: THE U/S REACH IS (±) 2000' LONG, V-SHAPED WITH (±) 5" AND 8" TO 1' SIDE SLOPES AND A STEEP REACH SLOPE OF (±) 3%. THE SECOND REACH (±) 7000' LONG (MOSTLY IN THE MOUNT HOPE RIVER TO HARRISVILLE), IS GENERALLY TRAPEZOIDAL IN CROSS SECTION WITH (±) 200' BASE AND (±) 20" AND 7.5" TO 1' SIDE SLOPES. THE AVE SLOPE OF THIS REACH IS (±) 0.6% (ASSUME $n = 0.050$ FOR BOTH REACHES AT FLOOD STAGE).

b) RESERVOIR STORAGE AT TIME OF FAILURE:

$$^{*}S_{max} \approx 565^{AC\,FT} \qquad S/2 \approx 283^{AC\,FT.}$$

*ACE ESTIMATE FROM DATA ON U.S.G.S. DWG. No. SN-W-50P, SHEET 5 OF 8.
SEE CURVE p. D-7

c) APPROXIMATE STAGE AT POTENTIAL IMPACT AREAS AFTER FAILURE:

i) 1ST REACH D/S FROM DAM (GOSS BROOK - SCOUT CAMP - INITIAL IMPACT AREA):

$(Q_{P_1})_1 \simeq 61000^{CFS}$; $Y_1 \simeq 19.9'$; $V_1 \simeq 118^{ACFT}$ @ (ON REACH OR (±) 2000'; $n = 0.050$)

$Q_{P_2} \simeq 48200^{CFS}$; $Y_2 = 18.2'$; $V_2 = 99.2^{ACFT}$; $\bar{V} = 109^{ACFT}$; $(Q_{P_3})_1 \simeq 49300^{CFS}$; $(Y_3)_1 \simeq 18.4'$
($Y_{c_1} \simeq 20.4'$; $V_n \simeq 22$ FPS)

SAY, $(Q_{P_3})_1 \simeq \underline{49000}^{CFS}$; $(Y_3)_1 \simeq \underline{18.4'}$ (UNIT IMPACT AREA)

ii) 2ND REACH D/S FROM DAM (MOUNT HOPE RIVER - WARREN HILL - SECO IMPACT AREA):

FLOW FROM MT. HOPE RIVER AT THE CONFLUENCE W/ GOSS BR.

D.A. = 12.6 SQ MI (ROLLING) .. CSM ≈ 1600 CFS/SQMI (SEE NED ACE GUIDELINES)

FLOW FROM MT HOPE RIVER: $(Q_{P_1})_{MH} = (PMF)_{MH} = 20200^{CFS}$

TOTAL FLOW AT GOSS BROOK / MT. HOPE RIVER CONFLUENCE AFTER FAILURE:

$(Q_{P_1})_2 \simeq (Q_{P_3})_1 + (Q_{P_1})_{MH} \simeq \underline{69500}^{CFS}$

THE REACH IS SUBDIVIDED TO HAVE $V \leq S/2$ (SEE NED-ACE GUIDELINES)

REACH L (FT)	Q_{P_1} (CFS)	Y_1 (FT)	V_1 (AC FT)	Q_{P_2} (CFS)	Y_2 (FT)	V_2 (ACFT)	$\bar{V}$ (ACFT)	Q_{P_3} (CFS)	Y_3 (FT)
3500	69500	15.5	320	42400	12.2	154	187	46500	12.7
2000	46500	12.7	219	28500	10.0	15.4	187	31100	10.4
1900	31100	10.4	156	22500	8.8	124	140	*23400	9.0

* $Q_{P_3} = 23400^{CFS}$ @ (±) 7900' FROM THE DAM OR (±) 5900' D/S FROM THE RIVER/BROOK CONFLUENCE, IS APPROX. THE RIVER FLOW D/S FROM GOSS BROOK BEFORE THE FAILURE OF THE DAM. i.e. THE FLOOD PRODUCED BY FAILURE

IF THE DAM IS DISSIPATED AT MT. HOPE RIVER, JUST REACHING WARREN-VILLE.

1) APPROXIMATE STAGE BEFORE FAILURE

i) 1ST REACH: $Q_o = 3200^{cfs}$ (see pg D-6/D-9) $Y_s \cong \underline{6.6'}$
($Y_c = 6.8'$; $V_n = 11.5^{fps}$)

ii) 2ND REACH: $Q = Q_{MH} + Q_{SN} \cong 23400^{cfs}$ ∴ $Y_{MH} \cong \underline{9.0'}$

e) RAISE IN STAGE AT IMPACT AREAS:

i) 1ST REACH: $\Delta Y_1 = \underline{11.8'}$ (INITIAL IMPACT AREA)

ii) 2ND REACH: THE RAISE IN STAGE WILL GRADUALLY DISSIPATE FROM (±) $(\Delta Y_2)_1 \cong \underline{6.5'}$ AT THE BEGINING OF THE REACH (±) THE CONFLUENCE OF THE STREAMS) TO $(\Delta Y_2)_2 = \underline{0'}$, JUST U/S FROM THE WARRENVILLE (SECOND) POTENTIAL IMPACT AREA.

III) SELECTION OF TEST FLOOD

1) CLASSIFICATION OF DAM ACCORDING TO NED-ACE GUIDELINES

a) SIZE: *STORAGE (MAX) ≅ 595 AC-FT (50 < S < 1000 AC-FT)
*HEIGHT ≅ 40.5' (40 < H < 100 FT)

*STORAGE C.E. ESTIMATE FROM DATA ON S.C.S. DWG N°CN-W-50P, SHEET 2 OF 8, AND, DATA ON "INFORMATION STORAGE AND RETRIEVAL - DAMS PLANNED AND CONSTRUCTED BY SCS" DATA SHEET FOR SITE ID. NO. CT-31)

*HEIGHT: SEE p. D-8

∴ SIZE CLASSIFICATION: INTERMEDIATE

b) HAZARD POTENTIAL: AS A RESULT OF THE D/S FAILURE ANALYSIS AND IN VIEW OF THE IMPACT THAT FAILURE OF GOSS BROOK DAM MAY HAVE ON THE INITIAL IMPACT AREA (BOY SCOUT CAMP - SEE p. D-8), THE DAM IS CLASSIFIED AS HAVING

HAZARD CLASSIFICATION: HIGH

2) TEST FLOOD: PMF = 3600 CFS

THIS SELECTION IS BASED ON THE RESULTS OF THE PREVIOUS ANALYSIS AND CLASSIFICATION.

SIOUX BROOK DAM

IV) SUMMARY

1) TEST FLOOD = PMF = 3600 CFS
(PARALLEL COMPUTATIONS HAVE BEEN MADE FOR ½ PMF = 1800 CFS AND ARE ALSO SUMMARIZED BELOW)

2) PERFORMANCE AT PEAK FLOOD CONDITIONS:
a) PEAK INFLOWS Q_{I_1} = PMF = 3600 CFS Q'_{I_1} = ½ PMF = 1800 CFS
b) PEAK OUTFLOWS Q_{B_3} = 3200 CFS Q'_{B_3} = 1500 CFS
c) SPILLWAY CAPACITY (SEE TABLE p. D-6)
d) PERFORMANCE:
(i) AT TEST FLOOD FREEBOARD (±) 1.0' (WS ELEV. 497.0 'NGVD)
(ii) AT ½ PMF. FREEBOARD (±) 2.6' (WS. ELEV. 495.4' (NGVD)

3) DOWNSTREAM FAILURE CONDITIONS:
a) PEAK FAILURE OUTFLOW: Q_{B_1} = 61000 CFS
b) FLOOD DEPTH IMMEDIATELY D_2 FROM DAM Y_0 = 17.4'
c) CONDITIONS AT THE INITIAL IMPACT AREA:
STAGE BEFORE FAILURE: Y_3 = 6.6' (Q_3 = 3200 CFS)
STAGE AFTER FAILURE: Y_3 = 18.4' (Q_{B_3} = 49000 CFS)
RAISE IN STAGE AFTER FAILURE: ΔY = 11.8'

PRELIMINARY GUIDANCE

FOR ESTIMATING

MAXIMUM PROBABLE DISCHARGES

IN

PHASE I DAM SAFETY

INVESTIGATIONS

New England Division
Corps of Engineers

March 1978

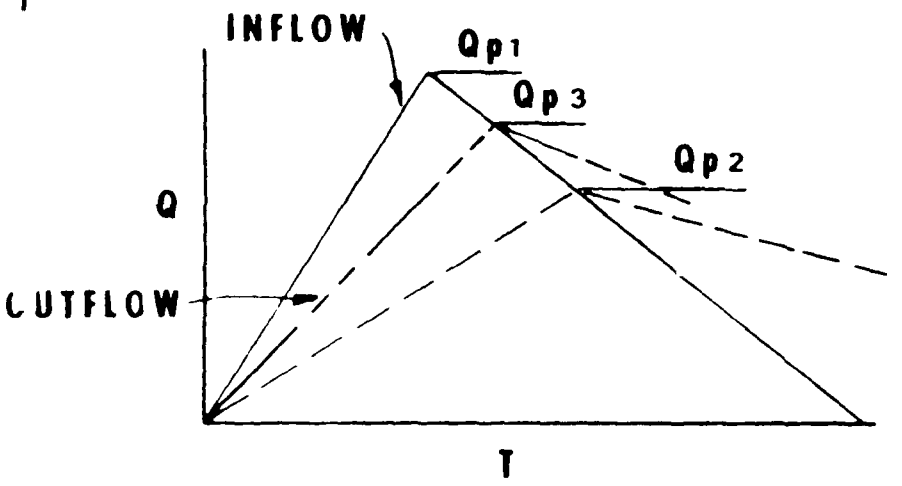
MAXIMUM PROBABLE FLOOD INFLOWS
NED RESERVOIRS

Project	Q (cfs)	D.A. (sq. mi.)	MPF cfs/sq. mi.
1. Hill Meadow Brook	26,600	17.2	1,546
2. East Branch	15,500	9.25	1,675
3. Thomaston	158,000	97.2	1,625
4. Northfield Brook	9,000	5.7	1,580
5. Black Rock	35,000	20.4	1,715
6. Hancock Brook	20,700	12.0	1,725
7. Hop Brook	26,400	16.4	1,610
8. Tully	47,000	50.0	940
9. Barre Falls	61,000	55.0	1,109
10. Conant Brook	11,900	7.8	1,525
11. Knightville	160,000	162.0	987
12. Littleville	98,000	52.3	1,870
13. Colebrook River	165,000	118.0	1,400
14. Mad River	30,000	18.2	1,650
15. Sucker Brook	6,500	3.43	1,895
16. Union Village	110,000	126.0	873
17. North Hartland	199,000	220.0	904
18. North Springfield	157,000	158.0	994
19. Ball Mountain	190,000	172.0	1,105
20. Townshend	228,000	106.0(278 total)	820
21. Surry Mountain	63,000	100.0	630
22. Otter Brook	45,000	47.0	957
23. Birch Hill	88,500	175.0	505
24. East Brimfield	73,900	67.5	1,095
25. Westville	38,400	99.5(32 net)	1,200
26. West Thompson	85,000	173.5(74 net)	1,150
27. Hodges Village	35,600	31.1	1,145
28. Buffumville	36,500	26.5	1,377
29. Mansfield Hollow	125,000	159.0	786
30. West Hill	26,000	28.0	928
31. Franklin Falls	210,000	1000.0	210
32. Blackwater	66,500	128.0	520
33. Hopkinton	135,000	426.0	316
34. Everett	68,000	64.0	1,062
35. MacDowell	36,300	44.0	825

MAXIMUM PROBABLE FLOWS BASED ON TWICE THE STANDARD PROJECT FLOOD (Flat and Coastal Areas)

River	SPF (cfs)	D.A. (sq. mi.)	MPF (cfs/sq. mi.)
1. Pawtuxet River	19,000	200	190
2. Mill River (R.I.)	8,500	34	500
3. Peters River (R.I.)	3,200	13	490
4. Kettle Brook	8,000	30	530
5. Sudbury River.	11,700	86	270
6. Indian Brook (Hopk.)	1,000	5.9	340
7. Charles River.	6,000	184	65
8. Blackstone River.	43,000	416	200
9. Quinebaug River	55,000	331	330

ESTIMATING EFFECT OF SURCHARGE STORAGE ON MAXIMUM PROBABLE DISCHARGES



STEP 1: Determine Peak Inflow (Q_{p1}) from Guide Curves.

STEP 2: a. Determine Surcharge Height To Pass "Q_{p1}".

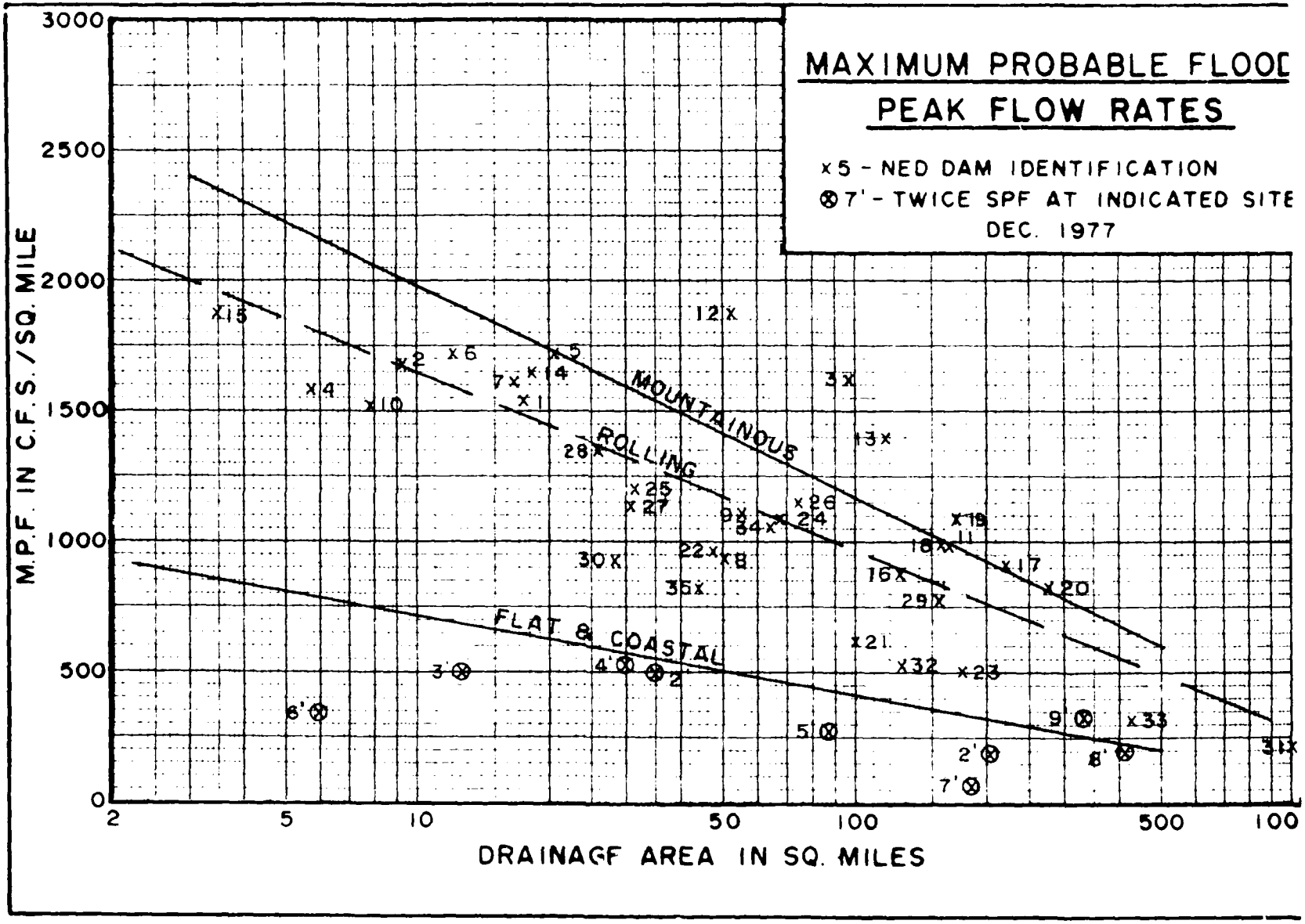
b. Determine Volume of Surcharge ($STOR_1$) In Inches of Runoff.

c. Maximum Probable Flood Runoff In New England equals Approx. 19", Therefore:

$$Q_{p2} = Q_{p1} \times \left(1 - \frac{STOR_1}{19}\right)$$

STEP 3: a. Determine Surcharge Height and "$STOR_2$" To Pass "Q_{p2}"

b. Average "$STOR_1$" and "$STOR_2$" and Determine Average Surcharge and Resulting Peak Outflow "Q_{p3}".


MAXIMUM PROBABLE FLOOD
PEAK FLOW RATES
x5 - NED DAM IDENTIFICATION
⊗7' - TWICE SPF AT INDICATED SITE
DEC. 1977
M.P.F. IN C.F.S./SQ. MILE
DRAINAGE AREA IN SQ. MILES
MOUNTAINOUS
ROLLING
FLAT & COASTAL
3000
2500
2000
1500
1000
500
0
2
5
10
50
100
500
1000

SURCHARGE STORAGE ROUTING SUPPLEMENT

STEP 3: a. Determine Surcharge Height and "$STOR_2$" To Pass "Qp_2"

b. Avg "$STOR_1$" and "$STOR_2$" and Compute "Qp_3".

c. If Surcharge Height for Qp_3 and "$STOR_{AVG}$" agree O.K. If Not:

STEP 4: a. Determine Surcharge Height and "$STOR_3$" To Pass "Qp_3"

b. Avg. "Old $STOR_{AVG}$" and "$STOR_3$" and Compute "Qp_4"

c. Surcharge Height for Qp_4 and "New $STOR_{Avg}$" should Agree closely

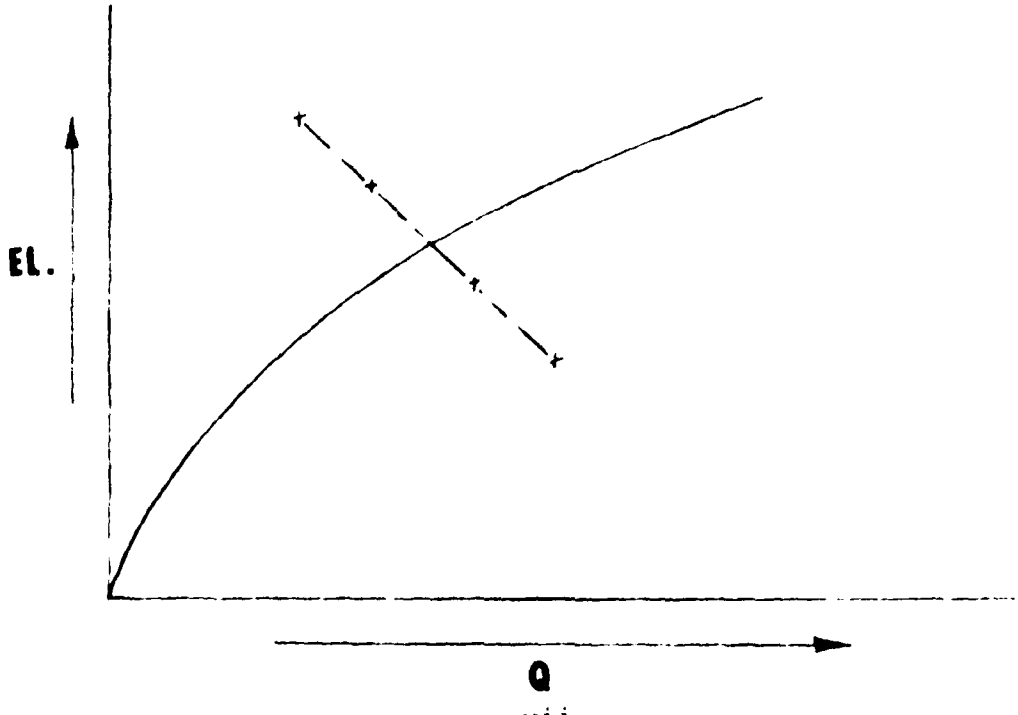
SURCHARGE STORAGE ROUTING ALTERNATE

$$Q_{p2} = Q_{p1} \times \left(1 - \frac{STOR}{19}\right)$$

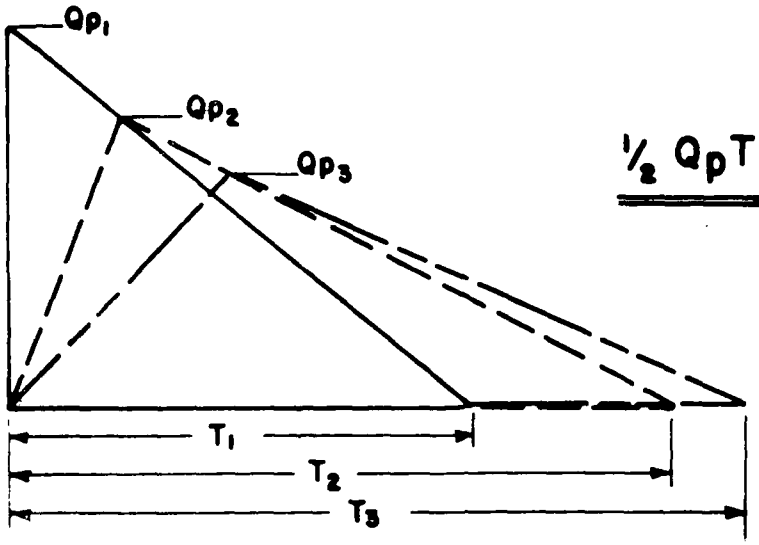
$$Q_{p2} = Q_{p1} - Q_{p1}\left(\frac{STOR}{19}\right)$$

FOR KNOWN Q_{p1} AND 19" R.O.

Q_{p2}	STOR	EL.



"RULE OF THUMB" GUIDANCE FOR ESTIMATING DOWNSTREAM DAM FAILURE HYDROGRAPHS



$\frac{1}{2} Q_p T = 12 S$

STEP 1: DETERMINE OR ESTIMATE RESERVOIR STORAGE (S) IN AC-FT AT TIME OF FAILURE.

STEP 2: DETERMINE PEAK FAILURE OUTFLOW (Q_{p1}).

$$Qp_1 = \frac{8}{27} W_b \sqrt{g} Y_o^{\frac{3}{2}}$$

W_b = BREACH WIDTH - SUGGEST VALUE NOT GREATER THAN 40% OF DAM LENGTH ACROSS RIVER AT MID HEIGHT.

Y_o = TOTAL HEIGHT FROM RIVER BED TO POOL LEVEL AT FAILURE.

STEP 3: USING USGS TOPO OR OTHER DATA, DEVELOP REPRESENTATIVE STAGE-DISCHARGE RATING FOR SELECTED DOWNSTREAM RIVER REACH.

STEP 4: ESTIMATE REACH OUTFLOW (Q_{p2}) USING FOLLOWING ITERATION.

A. APPLY Q_{p1} TO STAGE RATING, DETERMINE STAGE AND ACCOPMANYING VOLUME (V_1) IN REACH IN AC-FT. (NOTE: IF V_1 EXCEEDS 1/2 OF S, SELECT SHORTER REACH.)

B. DETERMINE TRIAL Q_{p2}.

$$Qp_2(TRIAL) = Qp_1 (1 - \frac{V_1}{S})$$

C. COMPUTE V_2 USING Q_{p2} (TRIAL).

D. AVERAGE V_1 AND V_2 AND COMPUTE Q_{p2}.

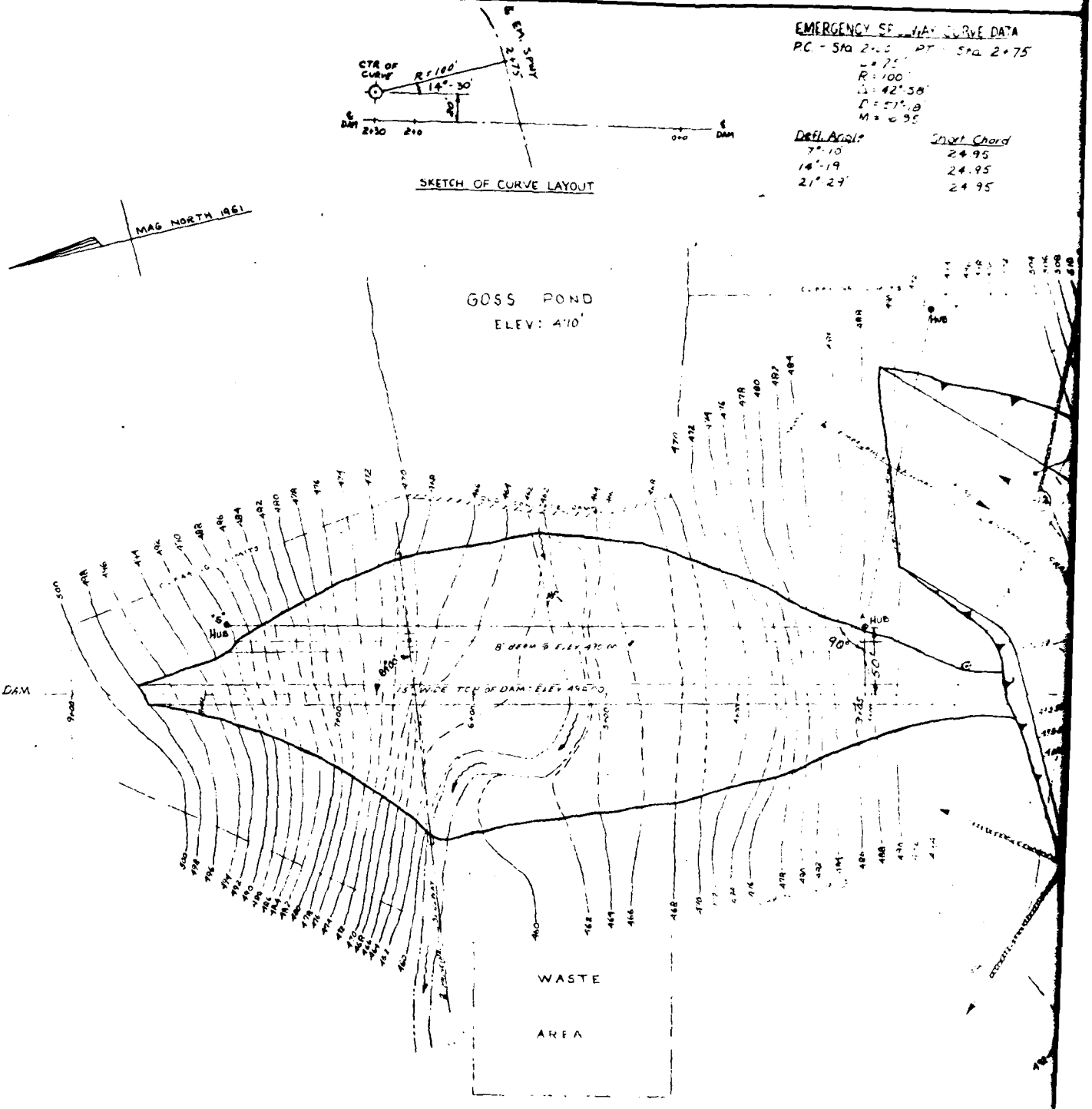
$$Qp_2 = Qp_1 (1 - \frac{V_{AVG}}{S})$$

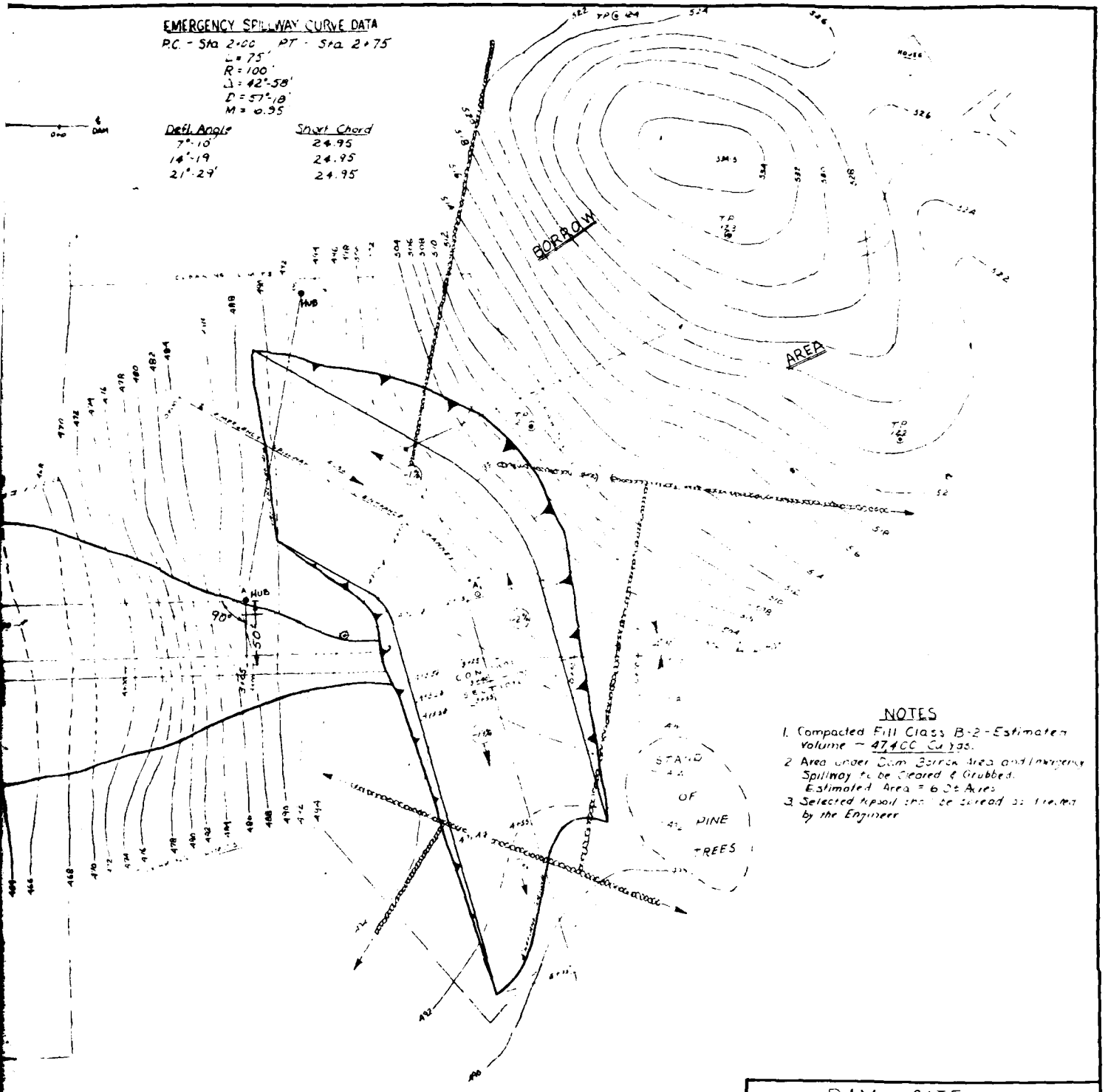
STEP 5: FOR SUCCEEDING REACHES REPEAT STEPS 3 AND 4.

APRIL 1978

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS


CTR OF CURVE
R=100'
14°-30'
20'
E EMERGENCY SPILLWAY
2+75
℄ DAM
2+30
2+0
0+0
℄ DAM
SKETCH OF CURVE LAYOUT
EMERGENCY SPILLWAY CURVE DATA
PC - Sta 2+30
PT - Sta 2+75
L = 75'
R = 100'
Δ = 42°-58'
D = 57°-8
M = 6.95
Defl Angle
7°-10
14°-19
21°-27
Short Chord
24.95
24.95
24.95
MAG NORTH 1961
GOSS POND
ELEV: 476'
℄ DAM
'S' HUB
'B' HUB
'A' HUB
8' BERM @ ELEV 476.00
15' WIDE TOP OF DAM - ELEV 486.00
90°
50'
WASTE
AREA



NOTES

1. Compacted Fill Class B-2 - Estimated Volume ~ 47,400 Cu Yds.
2. Area under Dam, Borrow Area and Emergency Spillway to be Cleared & Grubbed. Estimated Area = 6.0± Acres
3. Selected topsoil shall be spread as directed by the Engineer

DAM SITE

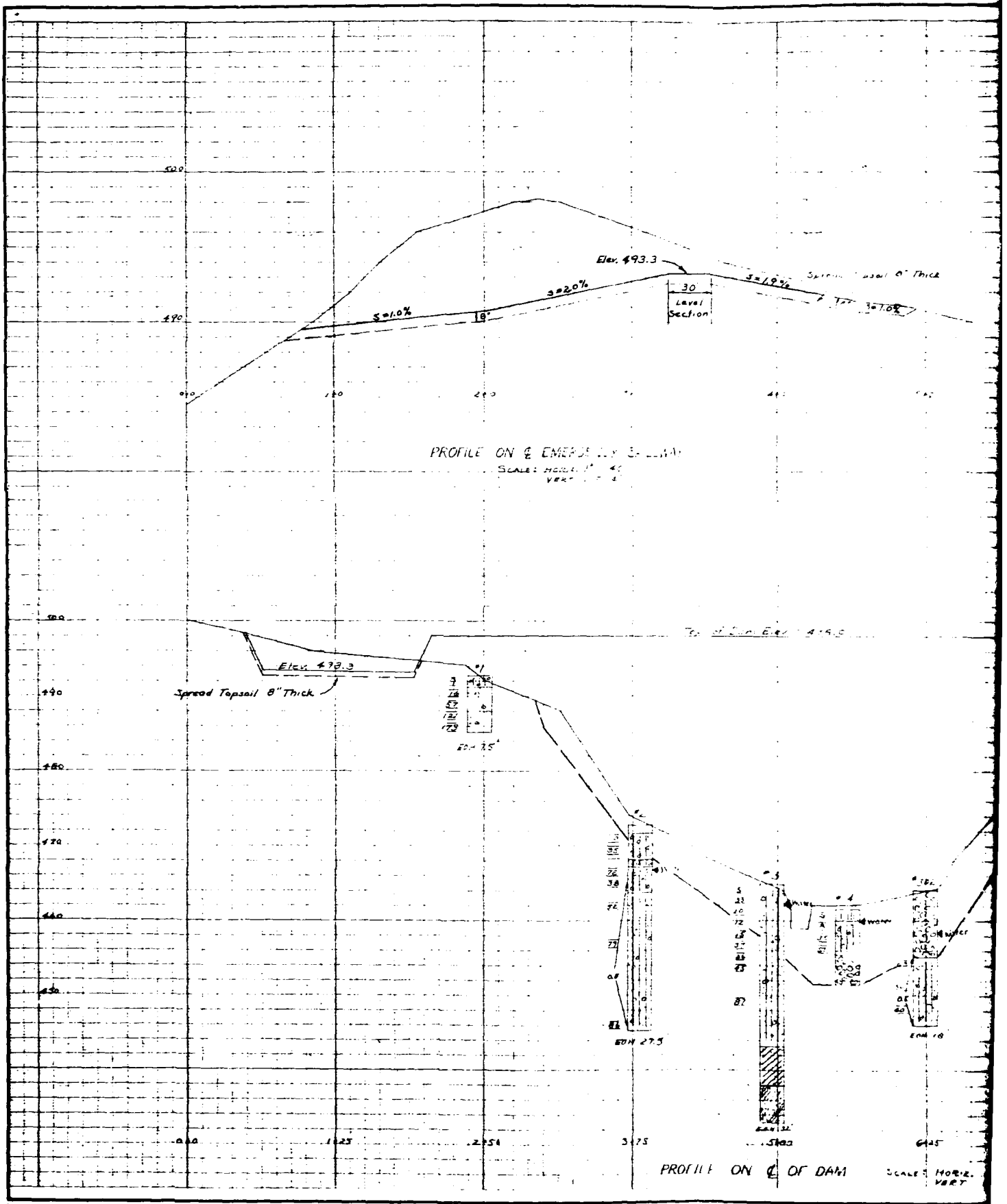
BOY SCOUT POND

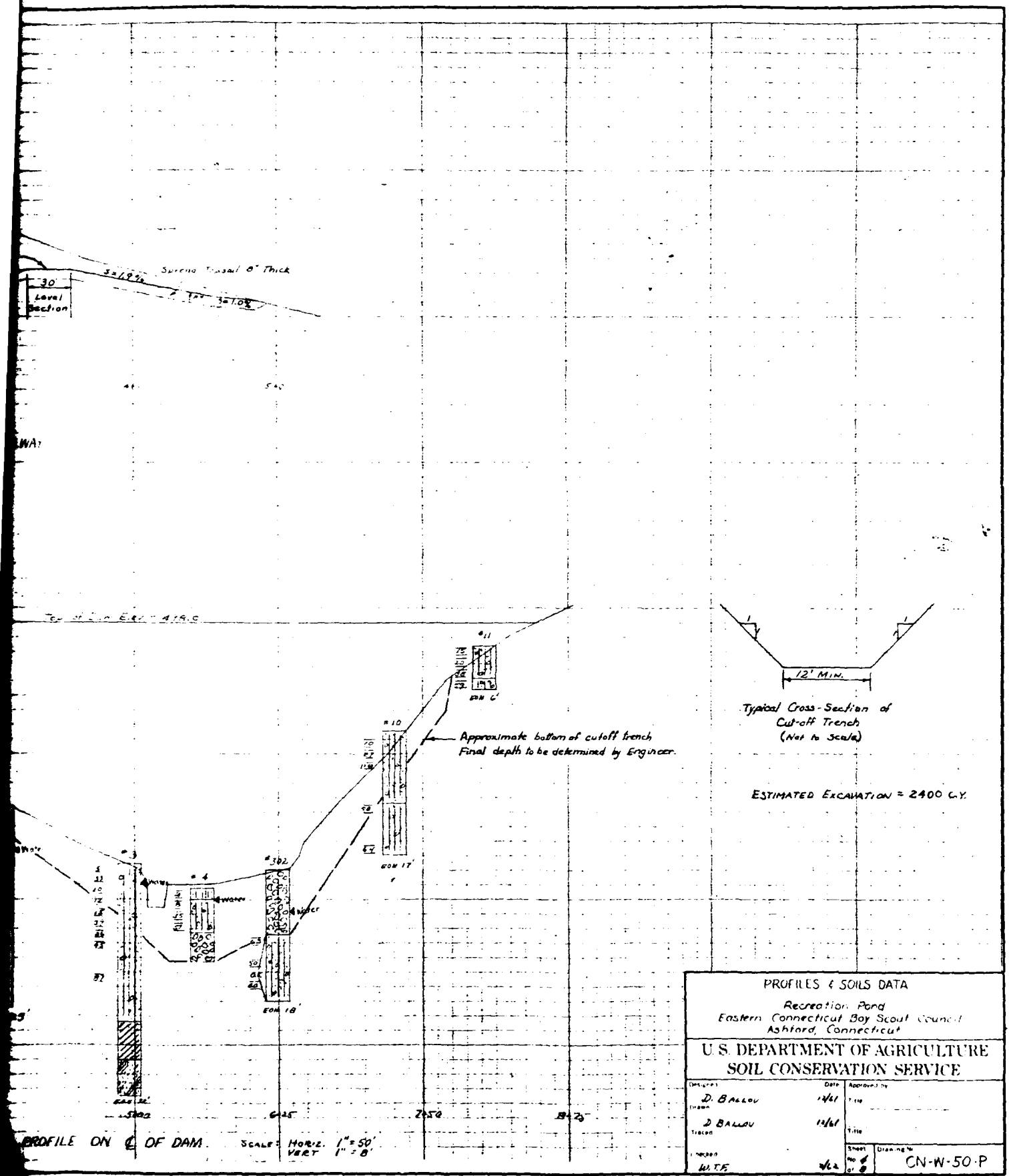
ASHFORD, CONNECTICUT

SCALE: 1 INCH = 50 FEET — CONT. INT. 2 FEET

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
DONALD T BALLOU	1961	Title
Drawn: DONALD T BALLOU	1961	Title
Traced		
Checked: W.T.F.	3/62	Sheet No. 3 of 8
		Drawing No. CN-W-50-P


Elev. 493.3
30
Level Section
S=1.0%
S=2.0%
S=1.9%
S=1.0%
18"
Spread Topsoil 8" Thick
PROFILE ON ℄ EMERGENCY SPILLWAY
SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'
Elev. 478.3
Spread Topsoil 8" Thick
Top of Dam Elev. 496.0
EOH 35'
EOH 27.5
EOH 12'
EOH 18'
PROFILE ON ℄ OF DAM
SCALE: HORIZ.
VERT.

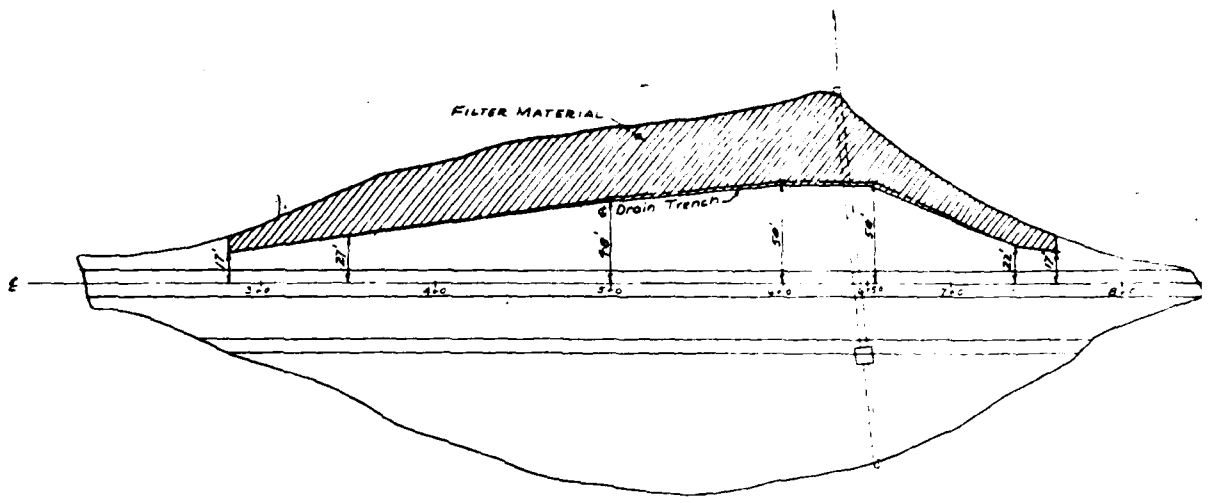


PROFILES & SOILS DATA

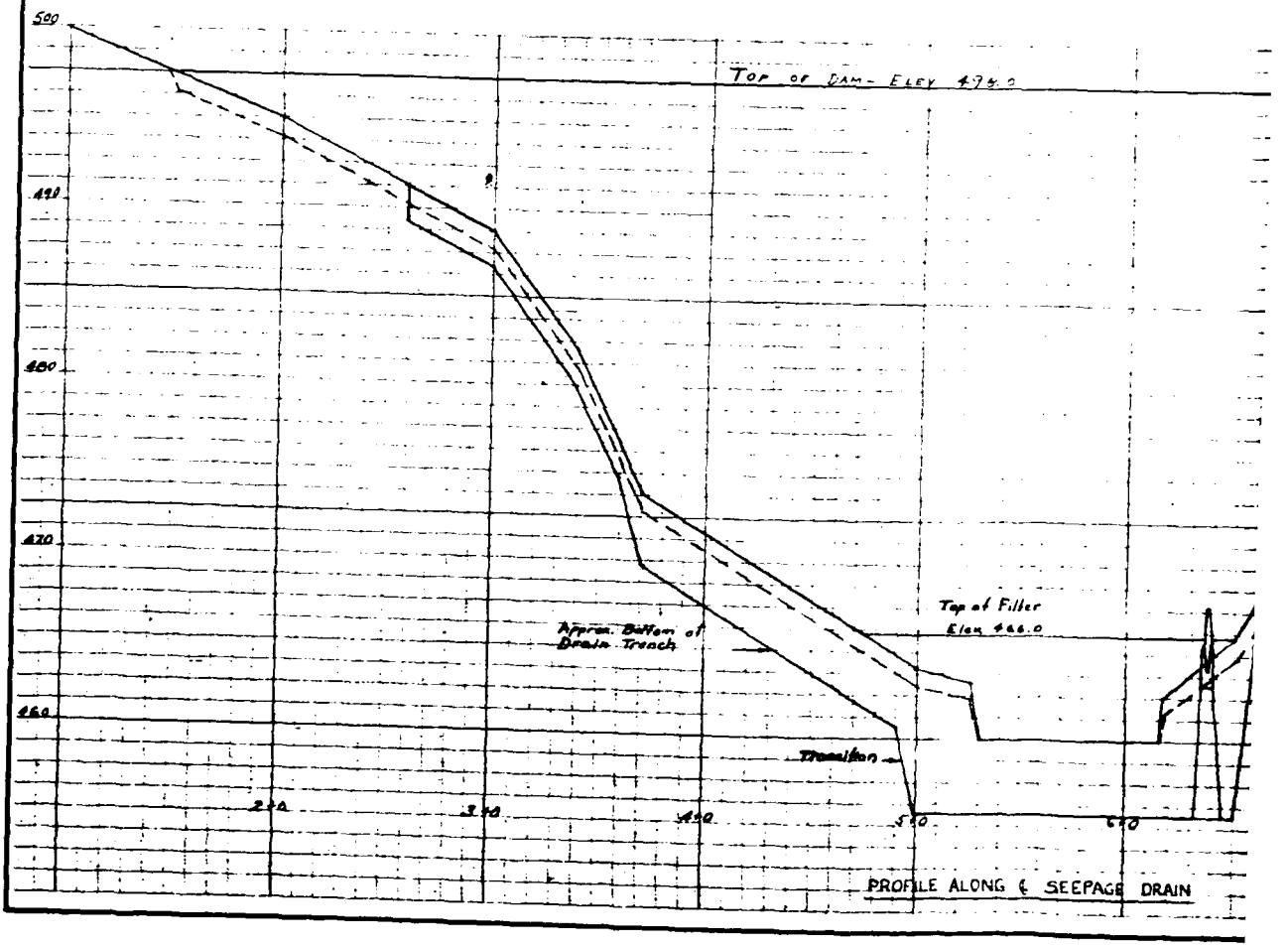
Recreation Pond
Eastern Connecticut Boy Scout Council
Ashford, Connecticut

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

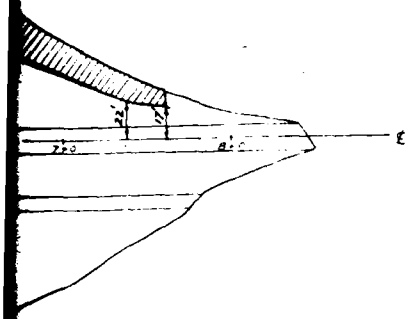
(Designed)	Date	Approved by
D. BALLOU (Initials)	11/61	Title
D. BALLOU Traced	12/61	Title
Checked W.T.F.	1/62	Sheet No. 6 of 9 — Drawing No. CN-W-50-P



PLAN VIEW OF SEEPAGE DRAIN
Scale: 1 = 5



PROFILE ALONG ℄ SEEPAGE DRAIN



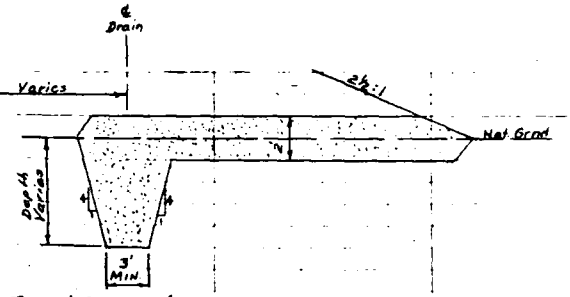
NOTES

1. Minimum depth of filter blanket = 2'
2. Filter material shall be so placed as to insure uniform gradation of the material and to avoid segregation.
3. Maximum depth of drainage trench to be determined in the field by the Engineer.

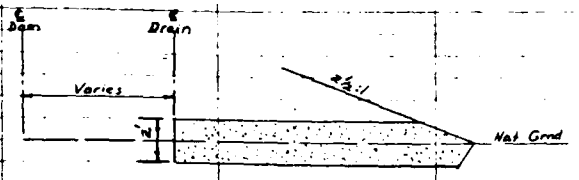
GRADATION OF FILTER MATERIAL	
SIEVE NO.	% PASSING
3"	80-100
1"	64-87
½"	53-76
#4	39-60
#10	28-46
#20	17-33
#40	10-24
#100	0-13
#140	0-9
#200	>5

ESTIMATED QUANTITY - 1700 C.Y.

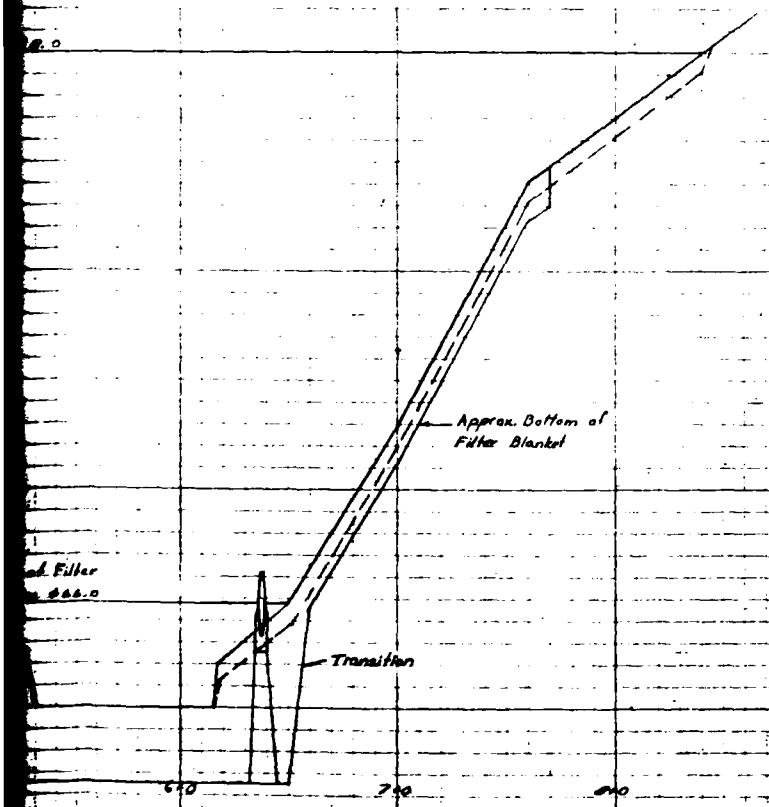
ESTIM. DRAIN EXCAV. - 500 C.Y.



Typical Section of Drain Between Sta. 3+70 and 6+50 (Not to Scale)



Typical Section of Blanket Drain – Sta. 2+60 to 3+60
(Not to Scale) Sta. 6+60 to 7+70



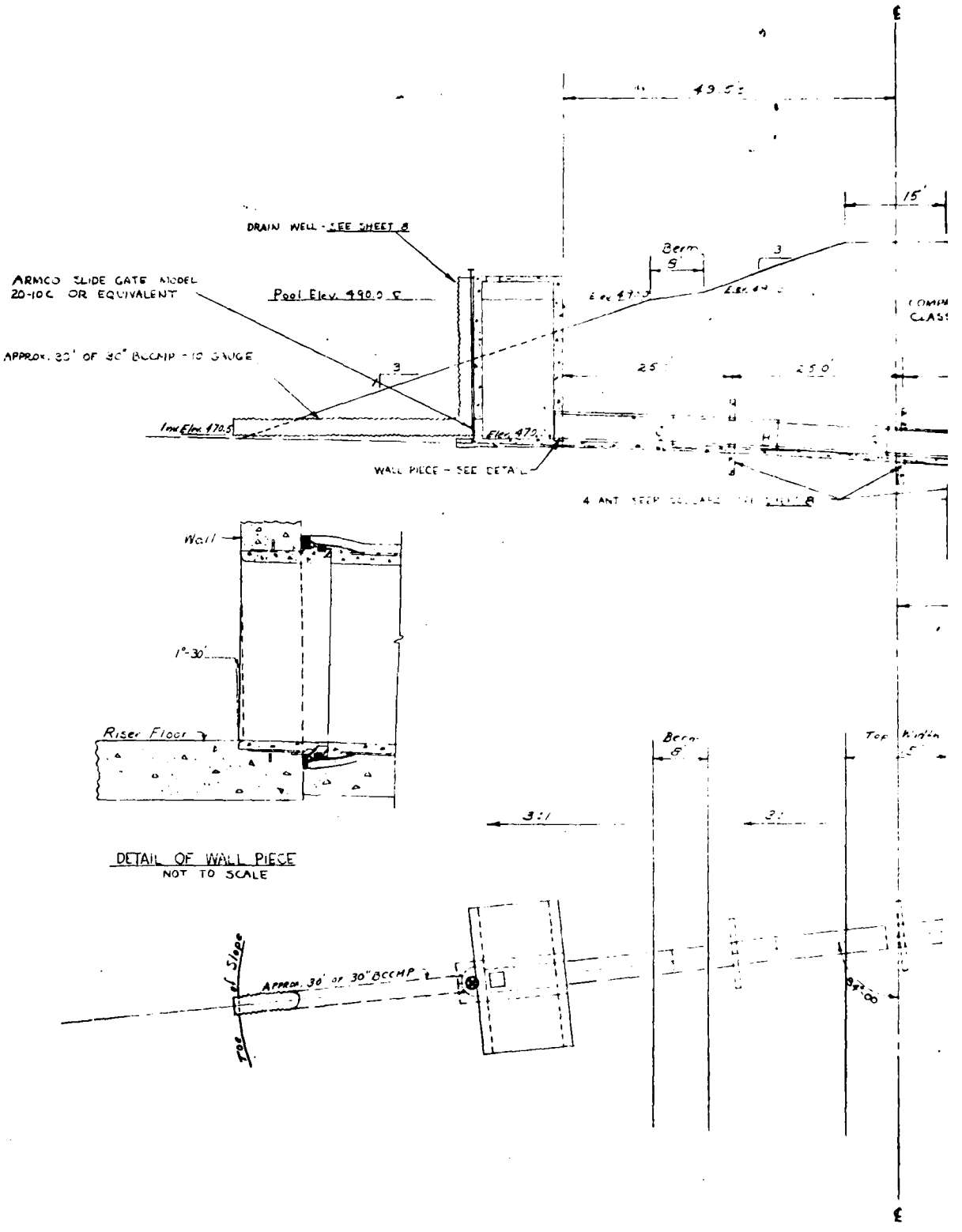
G & SEEPAGE DRAIN Scales: Horiz. 1"=50'
Vert. 1"=5'

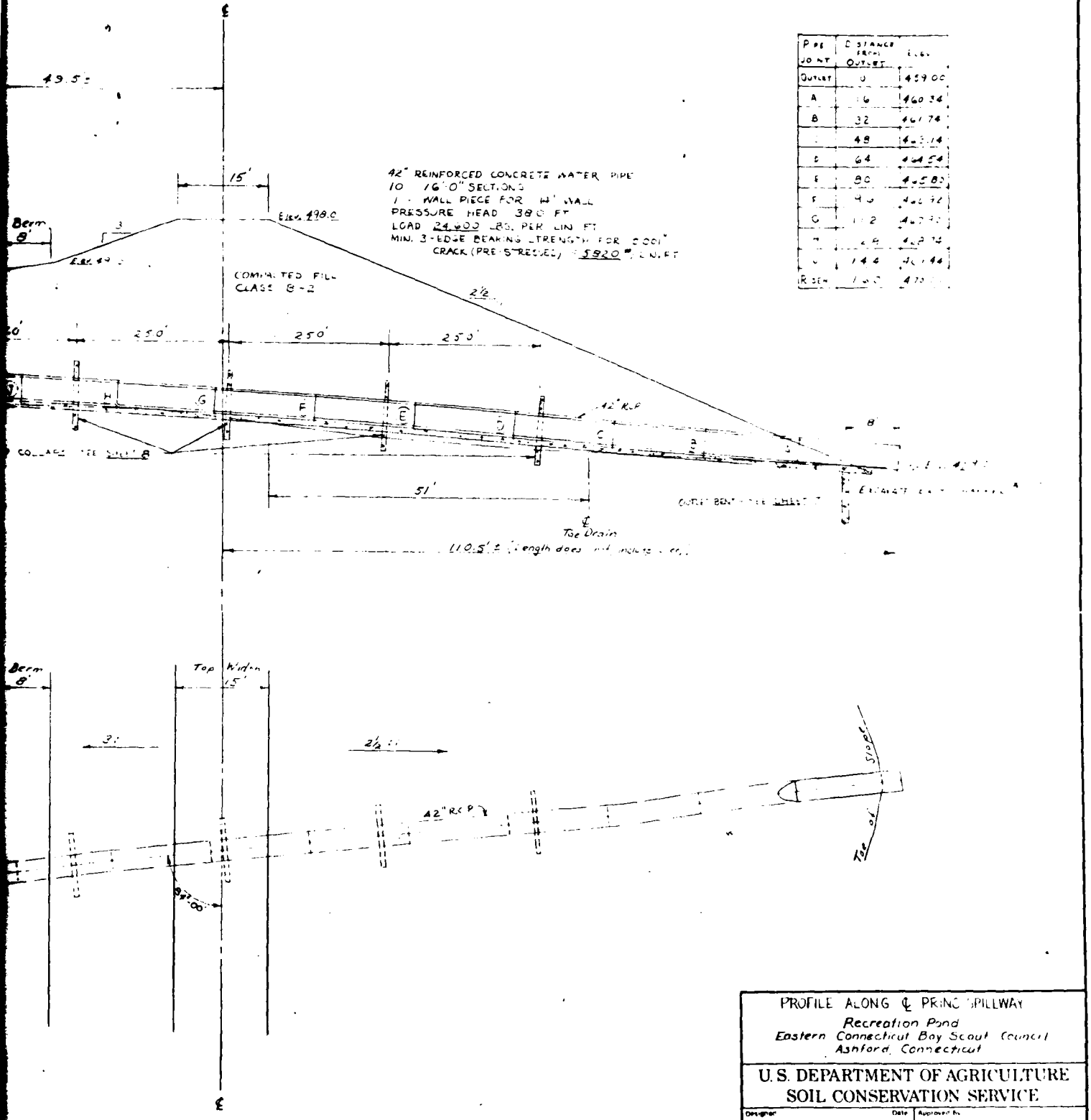
SEEPAGE DRAIN DETAILS
Recreation Pond
Eastern Connecticut Boy Scout Council
Ashford, Connecticut

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
WTF	2/62	Title
Drawn WJTF	2/62	
Traced		Title
Checked		Sheet No. 5 of 8
		Drawing No. CN-W-50-P

Sheet B-3


49.5'
15'
DRAIN WELL - SEE SHEET 8
Berm
5'
3
ARMCO SLIDE GATE MODEL
20-10C OR EQUIVALENT
Pool Elev. 490.0 ±
APPROX. 30' OF 30" BCCMP - 10 GAUGE
3
25'
25.0'
Inv. Elev. 470.5
Elev. 470.
WALL PIECE - SEE DETAIL
Wall
1'-3"
Riser Floor
DETAIL OF WALL PIECE
NOT TO SCALE
Berm
5'
3:1
3:1
Top of Slope
APPROX. 30' OF 30" BCCMP



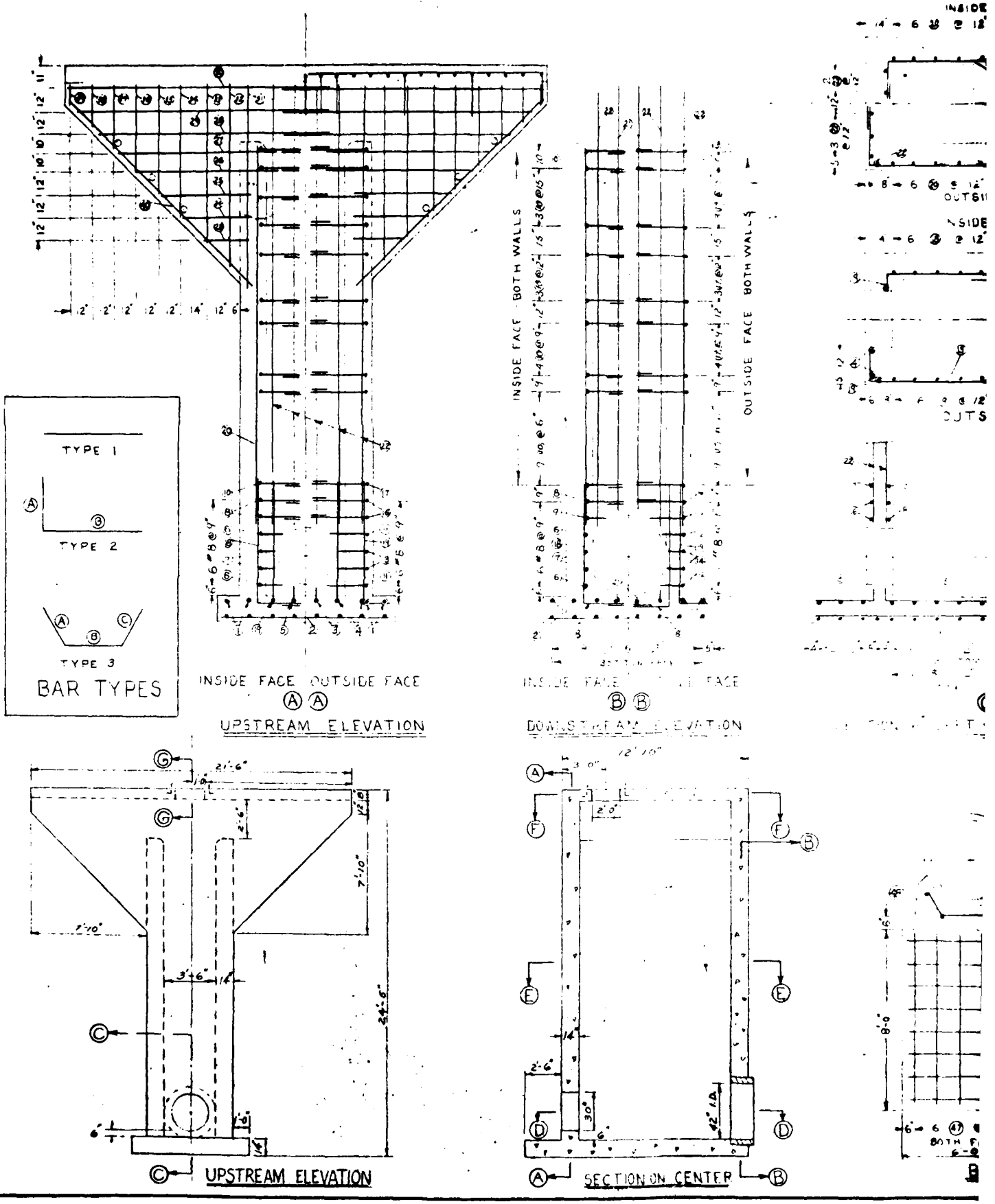
Pipe Joint	Distance from Outlet	Elev.
Outlet	0	459.00
A	16	460.34
B	32	461.74
	48	463.14
D	64	464.54
E	80	465.83
F	96	467.32
G	112	468.72
H	128	470.12
Inlet	144	471.44
Riser	150	472.00

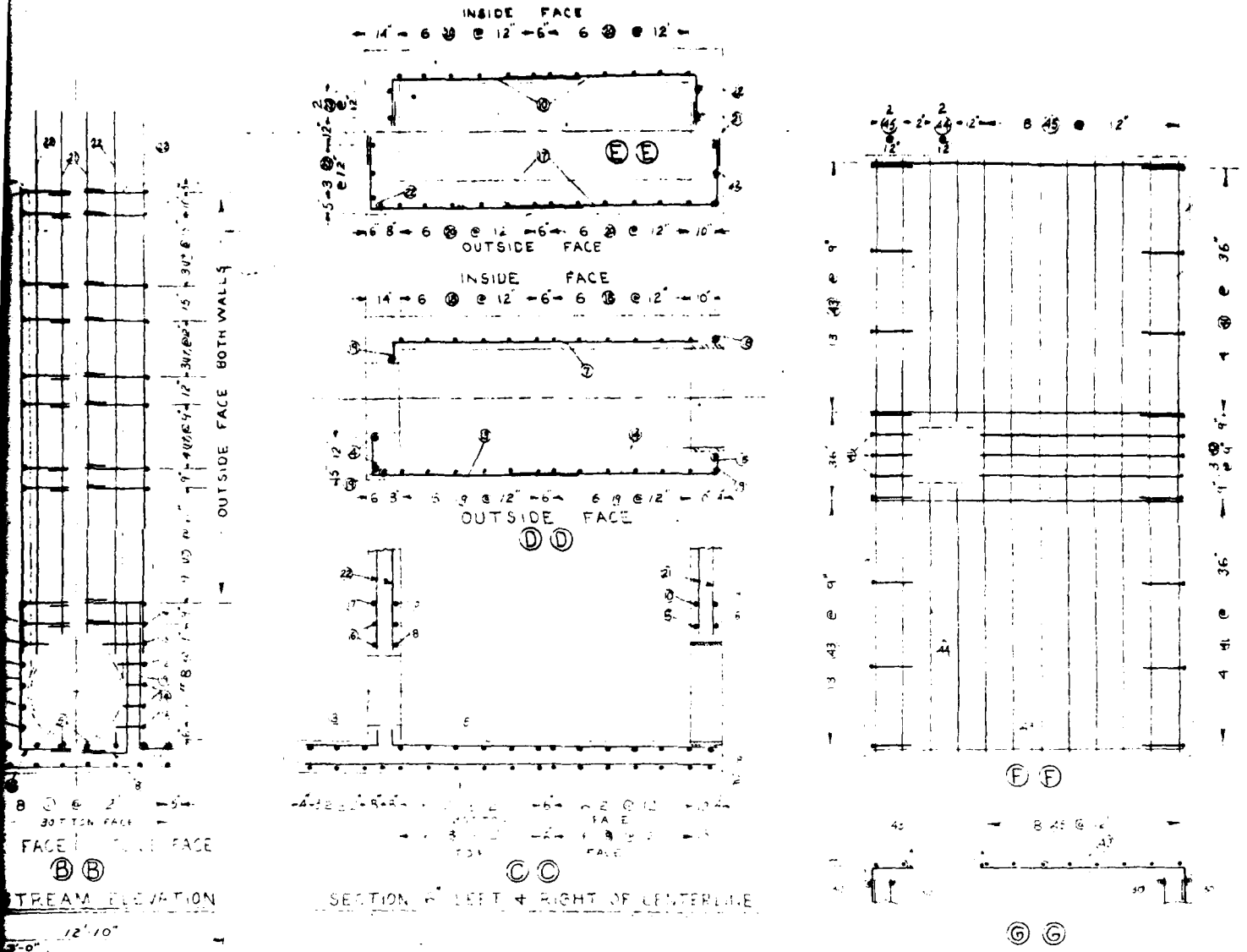
PROFILE ALONG ℄ PRINC. SPILLWAY
Recreation Pond
Eastern Connecticut Bay Scout Council
Ashford, Connecticut

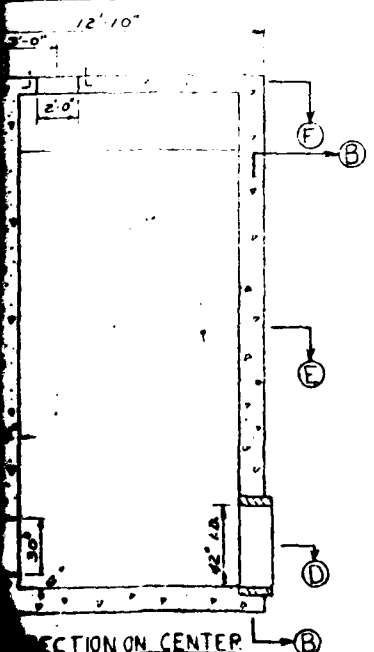
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

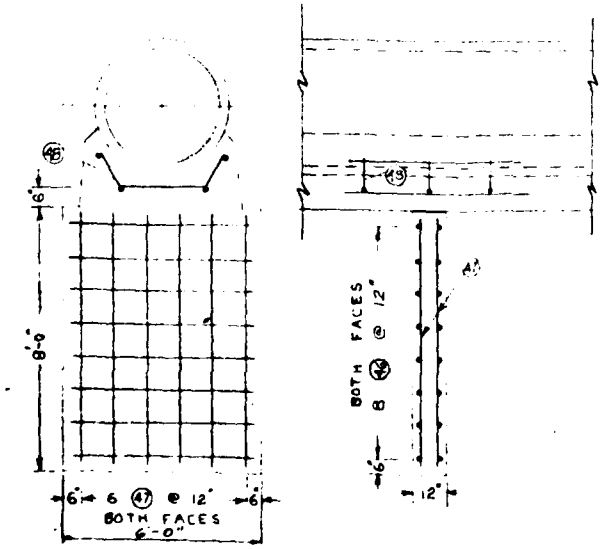
Designed	Date	Approved by
D.T.B	7/61	Title
Drawn W.T.F	2/62	
Traced		
Checked		Sheet No. 6 of 8

Drawing No. CN-W-50-P


TYPE 1
TYPE 2
TYPE 3
BAR TYPES
INSIDE FACE OUTSIDE FACE
UPSTREAM ELEVATION
INSIDE FACE BOTH WALLS
OUTSIDE FACE BOTH WALLS
DOWNSTREAM ELEVATION
UPSTREAM ELEVATION
SECTION ON CENTER







NOTES

1. All reinforcing steel to be lapped 30 bar diameters.
2. All reinforcing steel placed in concrete poured against the ground shall have a minimum of 3" clear cover. Where forms are used min. clear cover shall be 2".

STEEL SCALE: 3/8 INCH = 1 FOOT
STRUCTURAL SCALE: 1/4 INCH = 1 FOOT

STRUCTURAL STEEL DETAILS

BOY SCOUT POND
ASHFORD, CONN.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed DONALD T BALLOU	Date 1962	Approved by	
Drawn DONALD T BALLOU	1962	Title	
Traced		Title	
Checked MTF	W.L.L.	Sheet No. 7 of 8 sheets	Drawing No. CN-W-50-P